The Builder.

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Provincial Architectural Societies.

THE old craft guilds have been long dead. They suffered a natural course of disintegration consequent upon the enlargement of individual interests. They came into being for the protection of such interests. Much had to be sacrificed, it is true, where the common concerns of the many were involved, but as the safety of the individual and his personal opportunities increased, the sacrifice became less and less, and finally disappearing altogether, carried with it the keystone of the guild. The ghost of a guild still lingers in the trades-unions and in the corners and syndicates of the capitalist.

But those workers who are at once self-reliant and regardful of their particular work as being in itself an end are unlikely to seek any revival of trade-guild organisation. Societies which exist among those who follow the same calling are rather for purposes of recreation and good-fellowship, and any combination of powers which they may exert is towards the development of individual freedom and opportunity rather than towards their curtailment in any form. Yet we have lately in our own profession found evidences of this old desire for entrenchment cropping up in quarters where we should have least expected it. There is an effort, now and again recrudescent, to make architecture a close profession. This effort, when emanating from certain familiar sources, is, we think, largely artificial, and springs from a misplaced estimate of the value of a political opposition. But we have reason to believe that the principles of protection are cherished by no small number of provincial architects, who feel the pinch occasioned by the intervention of the tradesman. We have heard practitioners in the county towns complain that where, in the smaller surrounding towns, they could once command a remunerative supply of work, they can do so no longer. Some one, maybe a builder, a plumber, or an auctioneer, now finds time to devote himself, locally, amongst more substantial avocations, to the pastime of architecture. Meanwhile, the legitimate practitioner goes on increasing his numbers in the larger centres.

Then there is another thorn in the sides of these complainants. In a provincial town everybody knows everybody else, and social distinctions are consequently all the more sharply defined. A profession that carries weight with it has the power to render these distinctions elastic. The doctor and the lawyer have the advantage of the architect in this respect. The former belong to the so-called learned professions; their learned capital may be but small, yet they can always obtain credit. If only the undesirable builder and plumber could be shut out, argues our practitioner, cast forth like ballast from a balloon, I shall rise.

When the Royal Institute of British Architects set about the foundation of provincial societies in alliance with itself, hopes were entertained in the various centres that such a championship might bring about the desired reformation. Everybody was hurried into these local societies, in the expectation that the undesirable man, so caught and bound by schedule charges, would cease to be a menace. We are inclined to think, however, that this class of person would take his obligations but lightly, and that while congratulating himself upon his professional advancement, he would continue to cut his coat according to his cloth. The Institute has, moreover, ordained that every president of a provincial society is to become *ex-officio* a Fellow of the parent body. Since every member in rotation is likely to occupy the presidential chair of the lesser local societies, there will be a wreath of bay for all and every one. What effect this unearned privilege will have upon the prestige of the profession we are anxious to see.

These honours, however, do not touch the question of protection, and it is asked at these local societies' meetings that if not for this, for what are the members met together, and of what possible use can be an alliance with an influential body which does nothing to further so practical an end? The more chronic the ailment, the more sanguine is the sufferer of relief, and when some traveller in a patent medicine comes to his door prescribing registration for this and all other ills, the patient begins to feel better at once. The Institute itself is largely responsible for this restlessness in the profession. It at one time sailed very close to a scheme of compulsory examination, and has since excused its want of initiative by declaring that such a course is not at present expedient. It has, indeed, preferred the art of judiciously following to the science of leading. There was certainly much to suggest the wisdom of such an attitude. It is true that considerable enthusiasm was evoked among the students by the new examination for Associateship. They beheld in such a course a focus for much of the routine and information which they were acquiring in an office. But against this was arrayed the sarcastic opposition of many of the apostles of art. Much that was said by these dignatories was perfectly true, and in a manner unanswerable. The student was as much alive to their side of the question as he was to the other, but he was not unnaturally repelled by the priestly exclusiveness in which the so-called "memorialists" wrapped themselves. The examination has therefore met with success, although its prospects may not include that universal character with which it was the probable intention of its founders to endow it. The one argument of the memorialists was perfectly reasonable. You cannot, they said, examine in architecture in just that quality which distinguishes architecture from building, and in promising a supply of guaranteed architects you will be deceiving the public, or you will, at least, be confirming it in its primitive and erroneous conception of what the real article is. And their challenge was also perfectly fair. Make the examination, they said, one in building, and make it compulsory to builders and architects alike, and we will support you.

This was some ten years since. Mean-

while, we cannot help thinking that time is gradually solving the difficulty. To place an examination in the forefront without due reference to education must always be a mistake. London University, which for years prided itself on this anomaly, and existed purely as an examining body, has had to give way before a progressive public opinion, and to become a teaching university likewise. The Institute does not teach, although it encourages architecture by offering a number of prizes for which competition is invited. It is, however, in close touch with the Architectural Association, which in late years has become an important and efficient school. Any examination that follows such a course of study as the Association now provides is performing a most legitimate function. It is true that the Associateship of the Institute can only be approached by the door of such examination, but the bitterest opponent of examination can hardly claim that the Associate receives any undue prestige in consequence of the test to which he has been submitted. It is surely a most desirable thing that a self-respecting body should demand that all those seeking admission to its ranks should give some pledge or token that their interests are genuine and single. And if the captious and the careful refrain from dubbing the successful candidates architects upon the spot, yet these have given such hostages to fortune that the hope may be fairly indulged of their becoming architects some day. The objects of the examination, which are legitimate as they now stand, are, in our opinion, quite unlikely to extend themselves towards a universal application. The examination system, in all departments of life, has been upon its trial for some years now, and its shortcomings have made themselves evident. The art of passing an examination may be learned, just as may any one of the subjects which it includes. The candidates' preparation for the examination is what demands inquiry, and this investigation can hardly be undertaken where no system for preparation exists.

As we have already intimated, an examination in architecture, which shall be a guarantee to the public in case of a candidate's success, and a refusal to allow him to earn his livelihood in the event of his failure, must meet with especial difficulties. The public, we may add, is already protected against violation of the laws of health, and for much of the bad building executed it is the public who are responsible. Even the jerry builder knows what proper construction is, but he has been called into existence to provide something which is cheap, and it is to his credit that he has not betrayed the trust reposed in him.

We have endeavoured to make it clear why we think there will be no Registration Bill. The one formidable hindrance in the eyes of its supporters is what they contemptuously call the "art-architect," and their hostility to him is increased by the fact that, despite their contempt, his opposition has hitherto proved insuperable. In the provinces often he is but little understood. Enthusiasm for his work is the antiseptic which has prevented his position from degenerating into a cult. Enthusiasm has not pierced the conventional routine of much provincial practice, and the artist is considered as the creature of fads and sentimental limitations.

Technical education has been one of the motive powers which have driven us back to a new starting point, and when this has matured itself examinations may have more reasons by which to recommend themselves in the applied arts. But even then they are unlikely to assume undue prominence. France, with its many admirable systems for education, has no compulsory examination in architecture. We believe Spain is the only country where the principle is enforced, and this, it must be allowed, is a precedent which can carry but little weight.

All this is, we are afraid, but cold comfort for the provincial architect, who is casting about for immediate remedies to alleviate the ills of which he is so conscious. But we can assure him that the reform which we advocate is sure, if slow. As to the competition set up by the quack practitioner, protection cannot stop it. The doctor and the lawyer are protected, but the doctor complains of the prescribing chemist, of the medical officer to the sick club, and of the promiscuous hospital relief; while the man of law has many a little job appropriated by the accountant.

When the architect has fulfilled all his own possibilities, the question of protection may be more appropriately introduced. The students with whom the future lies have too often but small ambition, and this is in a great measure the fault of their principals. Yet seeing how few advantages the more remote provincial towns possess, compared with the parent centre, we think much might be done by the Royal Institute itself. Merely to create these allied societies is not enough. They should be visited, and kept in touch, and a new life thereby brought into them and sustained. Travelling lectureships might be organised upon the model of the University Extension movement. This, again, would create a demand for a local architectural library, which, when found, might be supplemented from the loan library of the Institute. Some action of this nature would do far more to strengthen the position of the Royal Institute in the provinces than an indiscriminate distribution of honours.

NOTES.

Staines Reservoir Scheme.

MR. SHAW-LEFEVRE has written a second letter to the *Times*, repeating his illusory views with regard to water-works engineering in general and to the Staines reservoir scheme in particular. He reiterates in a mechanical sort of way that "the puddle wall at Staines is less by nearly one-half than what is usual in such cases," and plaintively laments the intention of the engineers "to dispense with the middle embankment in future reservoirs." As Mr. Shaw-Lefevre contends that there is no reservoir in England in any way comparable to that at Staines, it is not at all clear what he means by the phrase "what is usual in such cases." Further, nobody has ever suggested that the alternative Welsh reservoir should be partitioned off into some twenty or thirty compartments, with the view of preventing "wave action of the water, the danger of inundation," and of aiding cleansing operations. In his last letter, Mr. Shaw-Lefevre rather avoids any detailed discussion of engineering matters, and devotes his energies to the presentation of figures in a manner which could not be excelled even by the Asylums Committee of the London County Council. Lord Llandaff's Commission has stated the cost of the Welsh scheme would be 15,406,000*l.*; competent engineers have estimated the cost at 23,878,000*l.* and 33,843,000*l.*; and the London County Council Bill, now before Parliament, provides the amount of 18,100,000*l.* in respect of the same works. Mr. Shaw-Lefevre now tells us that all these people are wrong, and that the real cost of the Welsh scheme is only 10,032,000*l.* This figure represents Sir Alexander Binnie's estimate of the bare cost of the works. It includes nothing for law expenses, for accumulated interest, nor for pumping charges capitalised, and Mr. Shaw-Lefevre adds nothing when he tells us that this sum covers the real cost. When he turns to figures bearing upon the outlay involved in the Thames scheme, Mr. Shaw-Lefevre suggests amounts which cannot be really known until the appendix to the Report of the Commission is published. It would therefore be futile to discuss the hypothetical sums named, beyond making the remark that a capitalised sum is this time included for pumping charges, though law expenses and interest are omitted. Further, the altogether unwarrantable item of 500,000*l.* is inserted for making additions to the puddle walls and embankments, which the most competent engineers in the country declare to be unnecessary. By methods such as these, Mr. Shaw-Lefevre endeavours to show that everybody is wrong but himself. Even supposing his hypothetical figures constitute an approximation to the actual figures to be disclosed hereafter, the fact that interest is omitted is a sufficient condemnation, because the amount chargeable to the Welsh scheme is naturally very much greater than accruing in the case of the other. Until Mr. Shaw-Lefevre came forward as an authority on engineering, very few people knew the precise amount of his knowledge in this respect, and we fear his recent demonstration is not likely to add to his reputation as an expert on financial matters.

Electric Tramways.

THE passing last week by a Select Committee of the House of Commons of the Bill promoted by the London County Council to introduce electric traction into their tramway system is, perhaps, the most important step recently taken in the practical use of electricity in this country. It means, in effect, that all tramways will now within a short space of time be worked by electricity. London has been behind many provincial towns in the use of electricity. We hope we may take it that for the future the metropolis will endeavour to lead rather than follow other towns. The spasmodic use of electricity for lighting in London is amusing, if it were not annoying, and it is to be hoped that not only will the system of electric tramways be municipal, but that it will be increased, and give an impetus to the use of electricity in many other ways in London.

The Baltic Exchange.

MR. W. WIMBLE and MR. T. H. SMITH, as joint architects, have prepared plans and designs for the erection of a new Exchange which is about to be built for the members of the Baltic and the London Shipping Exchanges —in lieu of the present premises in Threadneedle-street and Billiter-street. The fresh

site extends over an area of 28,700 superficial feet, which is now covered by the freehold premises comprising Jeffrey's-square, Nos. 26 and 28, St. Mary-axe, and Nos. 23-4-5, Bury-street, that will be acquired from the City of London Exchange Syndicate. The new buildings, on a site of 18,515 square feet, will include suites of offices upon the upper floors, with refreshment, sale, and arbitration rooms, and a hall for public meetings in the basement story; their cost, including equipment, is estimated not to exceed 175,000*l.* It is calculated that the new company—under style of the Baltic, Mercantile, and Shipping Exchange, will derive a net annual rental of 13,675*l.* from those portions of the building which they will not need for their own occupation, and the entire property is valued by an eminent firm as worth 440,000*l.* when erected.

Storage Batteries.

MR. E. J. WADE read an important paper on "Storage Battery Problems" to the Institution of Electrical Engineers last week. It is astonishing that although storage batteries have been manufactured and used on a large commercial scale for the last twenty years, our knowledge of the physical processes involved is very little advanced from the state in which Faraday left it when he completed his classical researches on the electrolysis of lead salts. Mr. Wade gave an interesting sketch of a theory which explained apparently many of the curious phenomena observed, but although his theory is strictly logical, yet the complicated way in which he supposes the lead molecules to act, makes it appear very artificial. It gives one the impression that the next laboratory discovery about what goes on in the electrolyte will necessitate the giving of new properties to the molecules. It reminds one of Newton's hypotheses about the molecules which he imagined formed a beam of light. Mr. Wade deserves great praise for the emphasis he laid on the rules that ought to guide the practical manufacture of these cells. He insisted on the importance of porosity and the free diffusion of the acid throughout the cells. Theoretically, the plates ought to be able to take up from ten to twenty times their actual bulk of electrolyte, and yet ought to be fairly strong. In the subsequent discussion, Professor Ayrton pointed out the great commercial importance of the problem. He instanced the London Electric Cab Company, which had been ruined by not realising the necessity of never letting their accumulators run down till their voltage fell below 1·8 volts per cell. The company which had supplied the accumulators guaranteed to maintain them for three years provided they were never run down below this limit. Unfortunately, the Cab Company did not realise the importance of this until irretrievable damage had been done to the cells. Professor Ayrton quoted some laboratory experiments which seem to prove that if cells were charged at constant pressure instead of with constant current, as is the more usual practice, there would be a considerable saving of time and an increased efficiency of output.

Subways for New York.

THE Rapid Transit Commissioners of New York now have an excellent opportunity of providing for the construction of subways for some of the many conduits in the streets to be occupied by their new railway. As the *Engineering Record* remarks, Mr. Parsons suggested something of the kind about nine or ten years ago, but nothing was done, as the Commissioners thought any action would be beyond their legal powers. This gentleman has now received instructions to prepare plans for the work, which it seems the city authorities are disposed to regard with favour. It would be highly satisfactory if we could add that similar favour were generally exhibited in London in respect of proper accommodation for gas and water mains, electric cables, &c. When pipes are simply buried in the earth, there is always an element of danger owing to the escape of gas, and the waste of water by leakage is an important item which has to be paid indirectly by the public. Moreover, much loss is caused to the owners of property and considerable hindrance is caused to pedestrian and other traffic by the continued upheaval of pavements and roads, which might well be dispensed with.

The Viceregal Lodge, Dublin.

THE Lodge, in Phœnix Park, which the Queen will occupy during her approaching visit to Dublin, has its origin in the house erected about 1750 by the father of the first Earl of Leitrim, ranger of Phœnix Park, which was bought some years afterwards for the use of the Lords-Lieutenant in lieu of their summer residence, Leixlip Castle. Two wings were added by Philip, third Earl of Hardwicke, Lord-Lieutenant of Ireland, 1801-6; his successors in office, the Duke of Richmond (1807-13), and Charles, Earl of Whitworth (1813-7), erected, respectively, the Doric north portico and new entrance lodges, and the south front with its Ionic tetrastyle portico and angle-pediment, after Francis Johnston's designs, with which the façade was subsequently altered to correspond.

No. 17, Fleet-street.

IT appears that this house, which the London County Council are still considering the possibility of purchasing and preserving, shows a false front to the street, and that the original front is, on the first floor, some 20 in. behind it, with the old carved pilasters still in existence. The total cost of purchasing the freehold and putting the building in repair will be 27,300*l.*, of which 20,000*l.* is the price asked for the freehold. To this the Court of Common Council has agreed to contribute 2,500*l.*, which, however, does not go very far. If the purchase be decided on, it is intended to set back the ground floor only to the improvement line, the upper floors remaining in their present position, and being supported on cantilevers. The historic room on the first floor would be reserved for the public benefit, but it is suggested that it might be let to learned societies, &c., in the evening, and thus a considerable recoupment be effected, the room still remaining open to the public in the daytime. The sum required seems a good deal, but we think the object is worth the expenditure.

Launceston Castle.

SOME apprehension is felt for the stability of the castle keep, which stands upon a lofty mound where, it is stated, a subsidence has occurred that endangers the condition of the entire structure. The manor and honour of Launceston — originally Dunheved, the Swelling Hill, and also known as Llanstephadon—appertained from time immemorial to the Earls of Cornwall, whose chief stronghold was at Launceston Castle, having been bestowed by William the Conqueror upon his half-brother, Robert, Earl of Montaigne, whom he created Earl of Cornwall. Possession of the castle passed with the earldom, and it was subsequently annexed to the Duchy of Cornwall. Hubert de Burgh, who owned large estates in the county, was appointed governor of the castle, and sheriff, by King John. It subsequently passed by grant to the Dukes of Northumberland, as constables of Launceston. During the Civil War it was at first garrisoned for the Parliament by Sir Richard Buller, who, however, evacuated the fortress upon the approach of Sir Ralph Hopton in command of the King's forces; Sir Ralph held it for some while, but surrendered in August, 1644, to the Earl of Essex, after whose capitulation it again fell into the hands of the Royalists. Then, in March, 1646, Colonel Basset surrendered the castle to Fairfax; during the Commonwealth the property was bought by Robert Bennet, at the Restoration it reverted to the Crown. The keep of the ancient castle is situated upon the summit of a steep rocky mount, partly artificial, at whose base flows the little river Kinsey. The mount, measuring 300 ft. in diameter at its base, and rising to a height of 95 ft., has a platform—93 ft. in diameter—on which stand the three wards, within circular walls; the central tower, built of hard blue stone, and entered through a low triangular arch, is 32 ft. high, its inside diameter is 18 ft., and its walls are about 12 ft. thick. The lower courtyard is now a pleasure-garden, the hall, chamber, chapel, and modern gaol having been pulled down upon the removal of the Assizes to Bodmin in 1838.

Old Whitehall Palace.

IN the course of clearing the ground for the erection of the new War Office buildings, the foundations have been dug up of the house, No. 8, Whitehall, which was designed and built by Sir William Chambers for Lord Gower.* At a depth of about six ft. below the surface the workmen have found remains of what we take to be the former road which is plotted in Fisher's large-scale ground plan of the Royal Palace of Whitehall, dated "1680," but surveyed in or shortly after 1670. The road is now represented by Horse Guards-avenue and is delineated by Fisher as traversing the north side of "The [South] Court," the "Court" of Aggas's map. It extends eastwards, from the semi-circular "Palace Gate" to the "Pantry," and the "Great Hall," and so to "Chapel," and the "Palace stairs" beyond. The Palace Gate, next north to the Banquetting House, stands directly opposite the "Foot Guard House" of the old Horse Guards on the main street's west side—where is now the south block of the Horse Guards. Fisher's plan marks, also upon the site we describe, the "Wardrobe," situated just within and on the north side of the Palace Gate, and abutting upon a long gallery which leads northwards to "Sir John Trevor's" lodgings, where is the opening into Whitehall-place.

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* Since known as Carrington House; pulled down in 1886; see illustrations of the interior, in the *Builder* of August 9, 1884.

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Bristol Municipal Offices.

THE Municipal Offices Committee of the Bristol Town Council have reported in favour of a site for new municipal offices which seems of very doubtful suitability. It is, according to a sketch plan sent to us, a long and narrow piece of ground between Colston-street and the open space where, as those who know Bristol will remember, there has been a kind of long narrow garden or enclosure formed, with a monument at each end of it. The proposed site is not only long and narrow—a bad form for compact planning of any building placed on it, but for about two-thirds of its length the boundary lines are running together to a sharp angle at the west end, which is still worse for planning. If we remember right, also, the site is partly on the side of a slope. It is central enough, and would allow a good open view of any building erected on it; but to place a good building on it would be a difficult matter, whether in regard to planning or architectural effect. The leading motive for recommending it seems to be that of economy in regard to the purchase of the land. The Corporation would be wise to employ an architect as adviser in regard to the suitability of any site for the proposed building, as the two subjects, site and building, can hardly be considered entirely apart from each other.

Institute of Water Colours.

THE exhibition of the Institute of Water Colours is on the whole above the average. It includes unfortunately, as usual, some of those large, staring, and essentially vulgar works, such as "The Lancers, 1900" (148) which seem to find acceptance and central positions at the Institute. It is true that this originally graceful dance has in modern society degenerated into a romp, but the picture is an exaggeration, and has no qualities of artistic merit to atone for this. Two small and beautifully finished works by the President (Mr. Gregory) deservedly attract much attention—"A Guard-room Dandy" (341) and "Beggar Maid" (345); the former almost recalls Meissonier; in the latter an architectural erection, a state gateway with stone piers crowned by groups of white marble statuary, is admirably treated. Mr. Wimperis is quite at his best in three of his broadly-handled landscapes, of which "A New Forest Glade" (80) is the largest and most important, but all are equally good. Mr. Joseph Knight has several fine landscapes distinguished by his usual poetic feeling, a small one under the title "An Old Coach Road" (484) is a most perfect little work both in reality of effect and in the sentiment of the landscape. Mr. F. Walton sends two or three carefully studied landscapes from Sark. Mr. Pedder's "In the Reay Forest, Sunderland" (486), is a very true and careful study of Highland mountain scenery. In a higher vein is Mr. Aumonier's solemn effect entitled "Evening" (247). Mr. Wetherbee in "Ebb Tide" (328), has produced one of those combinations of figures and landscape treated in harmony with each other in which he excels, and this one, a melancholy sea coast with a seated figure of a woman with her face hid in her hands, is both in feeling and in breadth of style one of the most remarkable works in the exhibition. Mr. Byam Shaw's scene "The Outcast" (275), is effective, but rather theatrical, and the lowering countenance of the man who has been excommunicated is rather at variance with the pictured fact that he has divine consolation on his side. Among other works to be noted are Mr. Fulleylove's "Arc de Triomphe" (292) and his study of part of the Erechtheion (319); Mr. Arthur Tucker's small but very artistic landscape study, "Autumnal Showers" (99); Mr. Orrock's "Ulverscroft Priory" (116) and "Rottingdean from the Lewes Downs" (534); Mr. Henry Stock's small "Portrait" (269) of a lady; Mr. Yeend King's "Wareham" (286), with the old buildings bright in the sunshine; Mr. Cotman's "Ancient Fort, Suffolk" (331), a fine piece of colour; Mr. C. E. Johnson's fine and rich landscape, "Windsor, from Snow Hill" (430); Mr. Dollman's exceedingly clever and humorous study of the personages on a mail coach pursued by a highwayman, under the satirical title, "The Good Old Days" (469); and Mr. David Green's broad fresh seapiece, "Flood-tide" (587). The upper end of the East Gallery is occupied by a large collection of works by members of the Society of Miniaturists.

Architects in the "Red Book."

As most Londoners know, Webster's "Royal Red Book," as it is called, is a kind of London Directory for the upper ten thousand. The publishers, however, propose to add a new feature by publishing the names and addresses of "prominent tradesmen of the metropolis." It appears from the circular, calling attention to this, which has been sent to an architect who forwarded it to us, that in the eyes of the issuers of this aristocratic Directory an architect is a "tradesman," and is liable to receive a circular pointing out that the Directory has "a large circulation among the nobility and gentry." The specimen copy of the classified list for this portion of the Directory includes under one heading "Architects and House Agents." We should have thought the publishers might have known better than this, from the mere fact that a considerable number of well-known architects are included in their list of the "nobility and gentry."

THE ARCHITECTURAL ASSOCIATION.

A SPECIAL General Meeting of the Architectural Association was held on Friday evening, last week, in the Meeting-room of the Royal Institute of British Architects, at No. 9, Conduit-street, Regent-street, W., the President, Mr. G. H. Fellowes Prynne, in the chair. The object of the meeting was to consider the following alterations in the By-laws proposed by the Committee, viz.:—

To add the word *Honorary* before "Secretaries" in By-laws 17, 21, 25, 30, 32 (in two places), 43, 48, and 51.

[The above alterations are necessary, as Mr. D. G. Driver has been appointed Secretary by the Committee, instead of Assistant Secretary.]

By-law 38 to read *Half-a-Crown* instead of "One Shilling."

At the end of By-law 16 add:—"Any ordinary member elected between January 1 and April 30 in any session shall pay a sum of half-a-guinea in lieu of one guinea as the subscription for the remainder of the then current session, in addition to the entrance fee of two guineas."

On the motion of the Chairman the proposals were agreed to without discussion, and the special meeting then terminated.

The ordinary fortnightly meeting was then held, when the minutes of the previous ordinary meeting were read and confirmed.

Messrs. G. Drysdale and O. R. Goodman having been elected members of the Association, and Mr. H. C. Corlette having been reinstated as a member,

Mr. G. B. Carvill, hon. sec., announced the donation of twenty-seven models and casts of foliage, &c., made for work executed by the late William Burges, A.R.A., by Mr. John S. Chapple.

A vote of thanks was accorded to the donor.

Mr. R. S. Balfour, hon. sec., proposed a vote of thanks to Messrs. Farmer & Brindley for allowing members to visit their workshops on the 10th inst.

This having been agreed to, it was announced that the next meeting of the Discussion Section would be held on the 30th inst., when Mr. T. W. Aldwinckle, jun., would read a paper on "Ventilating and Warming."

The Chairman said he had been asked specially to give notice that the second meeting of the Colour Decoration class would be held on March 28. There seemed to be a falling off in the attendance at this class, and it was difficult to understand why. The subject was an invaluable one to architects and it seemed a great pity that a class devoted to one of the chief subjects of their art should fail for want of energy on the part of students. After the paper which was about to be read, he hoped they would receive the names of students who were anxious to join.

It was announced that the Land Surveying class would commence on April 14.

Mr. H. C. Corlette then read the following paper on:—

The Decoration of Churches.

"As a preface to all I may say in this paper, let me at once tell you of one or two convictions. First of all, it is the simplest thing in the world to stand up and give good or bad advice. But I cannot tell you anything new about the decoration of churches. This paper may show you something of the way the subject presents itself to my own mind. But no man ever learnt much from lectures, papers, talks, except, perhaps, the suggestion of a few ideas. We cannot possibly learn how actually to decorate a church or anything else by any other way than trying to design a church, to devise a scheme of decoration, and to do some decoration ourselves. It may be possible for me to tell you a few thoughts that are afloat in my mind about decoration. But theoretical and experimental design are one thing. At least, design is one thing, and it, like everything else, has those two necessary sides from which it must be attacked. Think of the course of a single idea in your own mind as a philosophical problem, and you will realise that there are three stages in its life if it is to be of any use. There is its first inception. Then it is considered, and if of value it is accepted. But the acceptance of an idea involves its application, so you pass on to find some opportunity for its expression. The origin, acceptance (or rejection), and application of an idea represent the three ages of its life. Now, new ideas concerning decoration are most likely to be derived from the study of applications of ideas whose use and value have been proved by experiment. It is no more than to do in matters concerning design just as you do when you go for a walk. You lift your foot and take a step upon the encouragement derived from experience in locomotion. Then you take another, but a different one, and so proceed. To do no more than read or hear about decoration, and not venture to try and do some yourselves, is absurd. It is a parallel to standing still in one valley and expecting to enjoy the beauties of another with its hidden streams and flowers, when you will not walk over an intervening hill.

When I accepted your Committee's invitation to read a paper upon this subject, I had no idea what this involved. A very little reflection was required to assure me that to deal with decoration under ordinary circumstances need present but very few real difficulties. For it seemed merely to call for some statement of my own opinions and preferences. But to speak about the decoration of churches was to tread at once upon very debatable ground, invite hostility, pleasant enough in itself but productive of little if it contended merely for propositions involving religious conviction, or taste, which necessarily admit of little solution by argument.

So it was advisable to find other grounds than taste alone, and to make them the base from which to urge the desirability—in fact, the need—of decoration in our churches. But, as artists, we are not very much of one mind concerning the principles involved in design; and, unfortunately, as Churchmen, under the present condition of things, our opinions largely

differ upon points of detail, though I hope not so much where essentials are the question. But, desiring to be courteous to your several points of view, I decided to avoid, as far as possible, any questions which are better not discussed on occasions of this kind. So when it became apparent that there were distinctly two broad aspects from which to view the subject, aspects which cannot be separated, it was inevitable that the course of the paper should be devoted largely to a series of suggestions of principle which should attempt, first, to show the intimate, the necessary relation of these two sides. Then, as far as possible, the natural course to pursue was to deal with each of these two leading ideas in continuation, and briefly take notice of a variety of matters in more detail.

Let me now ask you to come with me and meet these general considerations.

What are the larger ideas we should adopt in determining the relation that we must maintain between one part of the decoration in a church and another? This idea resolves itself at once into two general aspects—the ecclesiastical and the architectural.

The first deals at once with the object of the decoration and with the subject it may represent. And these both may be satisfied by the choice of theme if figure work is possible, and the selection of appropriate symbols, whether they be chosen among those taken from animate or inanimate nature, or from the colours which themselves may speak much thought to those who have been taught to read what they may reveal.

Next, architecturally, we are led to think of the manner by which that object may best be realised, and the subject be given appropriate expression in the field available.

Our bare materials have been led on from their incorporate state after having been severed from their condition in nature, to other realms of usefulness in our service by the exercise of man's skill. This skill has given them place in a building which is the result of thought, of design. The element of art has been introduced by that power of design, and to the capacities of will and mind are now to be added some expression of those of the imagination and affection. Without these, from mere technical ability we cannot derive architecture, that union of the arts which so pre-eminently appeals to us through the avenues of our emotional and imaginative faculties. And it is in decoration by means of colour united with form that we add those beauties which are the complementaries to all the preceding ingenuity. Without decoration in some form we cannot be satisfied. It is the sign of life, of fruition, of satisfaction, everywhere in nature. After every wintry death there is always a revival of fuller beauties in the spring for which we look with anticipating hope and joy. But sombre gloom is derisive. It weighs heavily, like a fog, over the spirit of happiness for which we always crave, and seek as a perpetual companion. Therefore, give men decoration which is not dull, and you may help them to be fresh too, and bright, and full of sympathy by the example of those associations in the midst of which they find themselves continually.

We have been thinking of general considerations. And to these there must be some focus for all our ideas—some central point of interest, both ecclesiastically and architecturally, which shall be the ruling idea to which all others in the whole treatment shall be related. And it is only by keeping this principal idea constantly before us that we can effect a prevalent unity in the completed scheme. Is it necessary to state in what position this central thought shall be? Where is the most important part of the church ecclesiastically? Where is it architecturally? Is it not to be found in that portion of the choir which is known as the Sanctuary, the Sacrarium? The position of the Altar, or call it Holy Table if you will, surely this indicates the place where all the ideas, the thoughts, the aims, the aspirations, the complete attention of both clergy and congregation should be concentrated? It is there that the most sacred part of Christian ceremonial is enacted. And it is within the immediate precincts of this spot that all the glory of art should be used to aid us in appreciating the sincerity, the sanctity, and the beauty of ideal which is there principally represented. If you would require precedent for such a method, have you far to seek? Go back to the beginning and see in the type of what the arrangement of a church should be how the same order was observed. In the Jewish Tabernacle you have it all. Read the repeated description in all its details and you will see how the Outer Court was arranged; how it stood related to the Holy Place; and how these both were connected in idea with, but separated in office and function from, the Most Holy Place and the Holy of Holies.

Examine not only the general arrangement of this Tabernacle, but also the details of which the whole was composed. You will there find a series of carefully ordered ideas. The screen, acting as a wall between the court and the region without that court, was composed of various materials. Excepting at the gate of entrance the material of the screen was a simple hanging of white linen placed as a veil between the posts. But at the gate or place of access to the court the material changed with symbolic intention, and was varied in colour.

The three divisions of the Tabernacle were a presentment of many things. But for our purpose they showed what was to be the general ecclesiastical arrangement of a Christian church. And in it we have known from the earliest times those separate but related parts, the nave, the choir or presbytery, and the sanctuary. It would be interesting to follow out the ideas suggested by these thoughts, but that would lead us on to deal with those principles which are the foundation of all ecclesiastical and architectural arrangements required in the planning and design of churches It, therefore, must suffice that our attention shall be confined to the principles of ecclesiastical decoration we may derive from this source. And these chiefly appear in the fact that the decorative treatment was carried from the Outer Court to the Holy and Most Holy Places as a progressive development moving upwards to a more perfect expression in strict relation to the same increase in the solemnity of the ceremonial. This you will find was the case from noticing that the value and quality of the metals used differed in each separate part. Brass or copper was exclusively the metal of the utensils or fittings in the Court, silver and gold in the Holy Place, and gold alone in the Most Holy Place. Again the curtains or hangings at the entrance to the Court itself and to the Tabernacle from the Court, though having the same colours, purple and blue and scarlet and white, for the ground, differed in richness from the hangings about the Court and the Tabernacle proper. They were wrought with the cunning work of the embroiderer, having on them those figures of the Cherubim which afterwards became so important a motive in all early and mediæval Christian art. Similarly were the same colours used on the veil separating the Most Holy from the Holy Place.

The ideas here suggested may, of course, appeal less forcibly, as principles, to you than they do to me, but I put them before you as matters worth considering, for having been brought in contact with them, they commend themselves to me as things eminently valuable as a subject to be thought about.

By colour alone we may have thoughts suggested to us. In hues of gold we see typified the security and undeniable truth of ruling principles: in blue the lights brought down to earth by the prophetic capacities of a searching imagination exercised under due subjection; in the red of blood the food of life, the power of human reason in full and sympathetic exercise; and in the whiteness of purged silver the purity of unselfish affection. And you will find that these colours and these metals with brass, or copper as it probably was, are the colours so often specifically mentioned in the descriptions of the Mosaic Tabernacle. They all had their office, their set place, position, and meaning.

The architectural design of a church is not a matter only of the inception and execution of æsthetic dreams. Architectural history necessarily covers a consideration of the causes of certain ideas as well as their execution as problems in structure, that is as works of building. In this aspect we are brought into immediate contact with what we may well consider the marvellous engineering skill of the mediævals. And this skill stood not alone in cold and unsympathetic isolation. It was not exercised divorced from considerations of beauty. For the mechanical elements of design were inseparably wedded to the architectural, and the product of the union was seen in the issue. There were the two parents of one being always discernible in the composite whole. The power of the two found expression far more effective in combination.

The one resulting work of art, or rather nature, for its production was an act of nature, was as a voicing of the powerful spontaneity of utterance which that language expressed by the beauty of silent form and colour. It was man's privilege to speak so in days when simplicity and sincerity of aim were more to him than self-grafted, forced, and self-conscious art. The one work was architecture, the corporate expression of art as a unity. And the elements to be discovered in the composition of this effort towards a unanimity of expression are to be seen in each branch of human skill, of whatever kind, that was called in to offer its tribute to this aim. There was the practical, the structural, the scientific, the engineering side by which some forms of skill were expressed. They were the display of sound common sense based upon careful observation of natural static laws, the qualities and properties of materials, and the allotment of each in consequence to its proper place and function in the scheme. They were the expression primarily of man's will under the guidance of his reasoning, thinking, observing mind. But reason and will alone do not produce architecture—that is, art—in its highest sense. They give us building and engineering purely, simply. The entire resources of man's being must be called in to aid if we are to see the manifestation of work which shall always appeal to the sympathies of other men. There must, therefore, beside the expression of his will and reason, also be afforded some scope for his imagination and his affections. How commonplace among us are the terms: "It is cold and hard," "it does not appeal to me," "it does not interest me," "there's no warmth in it," "it lacks expression"! And others: "How dignified!" "what reverence!" "there's an air of sincerity and strength in this," "it is full of thought and is a clever piece of structure, of design," "what a sympathetic combination of colours!" "how well the lines group!" "what a sense of proportion!" Now what are all these things but the presence of a mental and spiritual element in what we see, which speaks to us innumerable things—thoughts and ideas, feelings, aspirations? They are the voices of unheard, invisible things appealing to us by means of every form of visible and expressive symbol. This is part of the mystery of things; so full of wonderment to those who see the material expressions of mental and spiritual things, and seek further for the foundation upon which they all rest. They show us that if we would understand and appreciate something of the scheme of nature, of which we are to play the leading part, we need look past the material composition of the substance of surrounding things, and seek in them, by them, through them, for ideas which reason alone shall never discover nor imagination apprehend. It is the sympathy born of affection that will teach more to art concerning design than all our schools for the manufacture of unborn capacities. We have as architects to grasp, and act upon, the knowledge that it is necessary before all things in art to use our mind rather than our memory, our own observations and not so much the catalogue in printed type or illustrated page with which the libraries are overflowing. Avoid the fret and waste of incessant labour among books, and learn to be idle in order to think and dream. Go to the works in the library of nature. Creep about the mysterious piled walls of poetry and prose in stone and brick. Let us learn to design by the study of design, not by the unweaving of theories of supposed laws derived from original interpretations of natural suggestions.

Let me now touch upon another aspect. It is necessary that in decorating a church we should subject our scheme to some one ruling principle—one which shall enable us to keep always constantly in view the effect we may desire to produce. And by effect I do not mean merely an effect from the æsthetic point of view, but, without disregarding this, from that of a creative impression. By a creative impression we should understand that one result the whole produces upon the responsive spectator. You know well enough how externals affect the mind and whole being of any one who finds himself confronted by them. And it is almost trite to say that we are expected by each opportunity to express by means of architecture those feelings which are most required by the end for which the work has

been begun. And so, is it not necessary that we try first to make men feel by their surroundings that they are before a Presence which should at once call forth a reverent attitude of mind? Let us, then, have a breath of reverence first amid all the beauties you may devise. With such an end in view it will be necessary to avoid the theatrical, the striking, the bizarre element in all decoration that may be used.

It is not easy to arrange the various ways in which this subject may be approached architecturally; at least, not if you try to attack it by any orderly method. Under the first division of the subject I separated it into two leading aspects, and under the second of those—the architectural—there seem naturally to fall three sub-sections.

Under the first of these we had better, perhaps, consider the treatment of simple structure decoratively, that is, by the use of such colour as may well be introduced in the necessary parts of the building, in the next, the application to that structure of a simple and partial scheme of decoration, adopting largely only conventional pattern design, or diaper, and such like ways of introducing what is required. And under this heading might also be included the use of colour, sparingly, in the windows, on the floors, the roofs, and in the furniture. Then we might permit ourselves to be more lavish and think of a complete scheme for a fully decorated church. But the two latter will probably lend themselves better to our purpose if they are not treated quite apart, but as merging the one into the other.

But how shall we decorate our churches? With what means, what materials, shall we set to work? The list of methods is almost without end. It may be of some use to survey the catalogues and venture any remark or suggestion that shall occur.

And for convenience I shall give you heads and subdivisions, so that we may, to a certain extent, be methodical. Broadly, we have to consider surfaces horizontal, vertical, on the slope, and on the curve. Such as, for instance:—

1. *Flooring*, and the things about the same level to be used as the furniture of a floor.
2. *Walls*, flat, or with arcades and windows, in light and shade.
3. *Roofs*, including wood or stone vaults, domes, open timber work.
4. *Light*, natural and artificial.
5. *Furniture*, such as the font, seats, pulpit, organ, screens, altar, reredos, &c.
6. Specially decorated parts of the structure.

Under the heading "furniture" and "decoration" it will be possible to introduce any remarks about the second and third main divisions of that part of my paper which deals with the purely architectural aspects of the subject.

Let us take the floors first. The unredeemable hideousness of the present-day encaustic tile with its bilious yellow "art shade," its pinks and blues that stare with such effrontery—these are, as a rule, too terrible to think of. They make your flesh creep when they cross your line of vision, and send a dart of unsympathetic clamour direct to the seat of all your positive sensations. There is surely no reason why glazed tiles for a floor surface need be so grossly vulgar as they often are. But they are cheap. They may easily be procured. They satisfy the untrained taste of those who demand showy brilliance and cheap tawdriness in place of quiet ease of colour and repose. They leap at you when they should lie prone upon the floor of which they should be a part, not a mere ruse to attract our eyes to the region of our boots. Above all things, in treating a pavement let us endeavour to keep it where it is. Let it lie. Do not make it restless, not too startling, like a thing ready to meet your gaze half-way. It may be very beautiful, but, at the same time, if coloured, the colours should not wrestle with each other. They may be many, but in effect they should be one.

The flooring may be of wood. But as we are thinking of the decoration that it is possible for us to get by a thoughtful method of dealing with it, it is not necessary to dwell at length upon the ordinary boarded floor, except to remark that, if the woods were more easily available, it would be possible to discover many a fine and quiet beauty in the various textures, the grain, and the colour of several varieties used simply as well-set boards. They might be polished or not. Wood, too, is better in northern latitudes for this purpose, because it is not so cold as any form of flagging or tiling. But in England we do not see the floors of our churches as they do across the Channel. For we are wedded to the formal, long, depressing line of fixed benches, or to ranks of cheap chairs hustled together and screwed up to keep them quiet and in place. Perhaps in some respects it is well so, for order is truly better than noisy muddle, though the long horizontal lines of a bench certainly do not usually help the architectural treatment as a whole. Chairs are better, for they are more in sympathy with the prevailing lines of Gothic art. Let us accept, then, the fact that for the present the greater part of every nave floor is to be permanently hidden from view, except we wait and study it in the dips between the edgy waves of wooden seats. Then what have we left us which may, without futility, be dealt with by design? There is the space about the west end. Large it should be. Then there would be scope for your energy and room for our feet, and we should not feel that commercial considerations had overruled those of decent order and dignity. There would be space for the font to stand free and unencumbered, so that it might speak what it may well say both by its use and the beauty of design in which it may have been conceived. It would not then be hustled into a corner, which it is made to seek as a resort as if it were a thing of comparative insignificance. Give it place, and give it dignity. Let us show that by our treatment of it we know its use, and respect the purpose for which it is required.

There may be a porch or porches, and it seems reasonable to suggest, if these are to be paved with thoughts, that those thoughts should be related as introductions to those that shall be found within the inner doors.

We are still dealing with the first idea—the use of simple materials, and for a floor there are many such that are always available. The use of boards or wood blocks for the body of the church which is covered by the seating seems to be the suggestion offered by common sense for a reason already stated; but in the aisles or passages, and for the choir and sanctuary floor, something more interesting is required. It is not necessary to discuss tiles further, and the many patent flooring materials may speak for themselves to those who have experimented with them. Some are inoffensive enough, but many are rather trying in their dulness so far as colour is concerned, and lack of interest otherwise. Plain stone flags, or a broad use of two, or at most three, different colours in any materials, either of these ideas can produce happy results. But there seems to be a common fault among us by which we too much incline to cut up the floor surface into little patches. We use too small a pattern, or, without any pattern, we divide the pieces into diminutive parts which increase so largely the cost with no compensating effect; quite the reverse. We derive this peculiar tendency, no doubt, from the influence which modern tiles have exerted upon us. It would be preferable to see the mistake made in the other direction where the floor is concerned. It would help us to be rid of the analytical, the too logical and mental, view of things, and urge us to quit the habits of a fly and adopt by preference those of the eagle. We should be freer, more imaginative, more comprehensive, in looking at things then. It does not do in architecture, or in any work connected with it, to dwell too much on detail before a general idea has been conceived, so that some attempt may be made to work up to it. By following this method, details would be kept in place and always subject to the effectual combination of the several parts.

Any pavements in the body of the church are undoubtedly best kept in relation as a unity. There should be some kinship both in colour and design. They should not be dealt with in the different parts like separate families, each opposed in aim and idea to the other, and all the children pieces composing them quarrelling among themselves.

Those, too, in the choir should bear some link in their design which binds them in their relations on two sides—first to the nave and next to the sanctuary. It is consistent, too, with the principle evident in the design of the Jewish Tabernacle that we should increase the value, the beauty, the significance, and the rarity of our work as we approach the most important part of the whole undertaking. For the sanctuary should be architecturally, as it is liturgically, the most important centre of all our ideas; therefore it follows that we may endeavour to express more thought by our work at this point, and, as a consequence, the work in the sanctuary should, in the same respect, differ from that in the choir.

Before quitting the subject of floors it is natural that some reference should be made to the use of carpets or rugs, or both, in the sanctuary. These may be very beautiful accessories, but they may be, they often are, hideous excrescences when, as is so often the case, they are ill chosen both for their pattern and colour. This trouble frequently happens because, at the last moment, if you are dealing with a new church, just before the dedication, some well-meaning person comes forward and offers to provide these carpets. A worthy but untrained churchwarden sallies forth and selects an expensive object, never thinking of what may be its ill-assorted relation to any other decorative furnishing which should be, though it too often is not, in the care and under the direction of one skilled man. This man ought to be the architect, the child of whose brain the whole work is. He looks at it as a whole. Hopes and designs for it as a whole. And when such thoughtless acts as these are committed they cut his whole treasured framework across the spine, and his unity—by one deed of thoughtless generosity—becomes a broken aim.

If we are limited to the introduction of only so much decoration as can be obtained by the materials of the structure, and the means usually adopted for their preservation, such as painting or oiling the woodwork, we already are possessed of an ample opportunity. Say we were to use brick. Need all the bricks be the same colour? Need they be merely laid side by side, bed on bed, with no more thought than is required to set them truly in bond? Surely not. If you have decided to use brick for your walls, it is, of course, possible to use it throughout for the piers, arches, and windows. But may we not provide a welcome contrast by showing the brick in the mass and plastering some of the detailed portions of the composition. Or the idea might be reversed and the mass plastered, leaving the details to show the essential materials. And this use of plaster as a really beautiful material should commend itself more to our minds if it has not already a very high place in them. Think what the Byzantines and the mediævals did with plaster, even when it was not coloured. Especially in Belgium there are remarkably fine instances of the value of plain plaster as a finishing material for broad surfaces devoid of actual colour hues. But is there no colour in the play of light upon plain white surfaces of ever varying tones of grey shades? In strong sunlight they take to themselves tones of pale-gold if the windows are glazed with clear glass. When the clouds are heavy the shades of colour deepen into transparent purple-grey. If you would study the use of plaster, there is as I have said, plenty of it, and of a variety of colours too, to be seen in the work of the mediæval Belgian architects. There you see it used in conjunction with the purely Gothic treatment, which was one of lines rather than surfaces. But if you would see it applied to other forms, go to those most interesting domed churches in the south centre of France. There it will be seen introduced in buildings which are remarkable for their simplicity and breadth—if they have not been too much "restored." They are churches, too, which are conspicuous for the idea of quiet strength which a large unbroken space conveys. And they contrast with the more northern work mentioned in being treated rather for surfaces than lines. They naturally provide an opportunity for using applied colour on those surfaces, but of this I hope to speak later.

Then, again, are we limited to brick, or to brick in conjunction with plaster? Certainly not. Externally, we may use any combination of materials which are able to make themselves offensive to the assaults of climate. But it is not my intention to deal particularly with the decoration of churches so much from this point of view. The internal treatment is quite sufficient for one paper. But, naturally, the exterior lends itself to other methods, and is subject to the control of different principles from those which rule the consideration of interiors.

It is quite unnecessary to do more than remark that the use of stone allows us to adopt every variety of treatment for internal decoration. There is naturally a much larger choice in the selection of materials. For we are at liberty to use the softer as well as the harder stones without fear. And this provides an almost

unlimited palette of structural colours. How and by what means they may be combined must be left to individual taste. But in using them we should never forget the value of texture, the quality and nature of the tooling adopted in finishing the surfaces. For it is upon this detail that the beauty of stonework so largely depends. A rough surface in the masses, with a fine finish on details, makes a great difference in the ultimate effect, even if only one stone of one colour is used throughout. Different stones of similar colour, or rather other shades of the same colour, produce wonderful results. And it is gratuitous to speak of combinations of dissimilar colours, for it is an obvious method by which we may gain what is required. Brick with stone dressings, stone with brick dressings, stone surfaces with plaster details—either white or coloured, preferably with the ground chippings from the dressed stone—or plaster surfaces and stone dressings ; these are all familiar ideas.

The roof or ceiling of a church, however simple the structure, may well be used as a means of obtaining much decorative effect. We are able to do this by various ways. The mere arrangement of necessary timber will do a great deal if it is done with thought, not merely by following the customary dulnesses of a puerile text-book on what is called construction. If you do not show your wooden roof structure as a part of the design, but cover it up with a stone or brick vault, a plastered ceiling of brick, concrete, or wood, or a boarded one, much can be done with these. A stone vault with its moulded ribs should be beautiful in itself, even though the stone used be of the usual pale shades of cream or yellow. But need the ribs be the same colour, or even the same stone as the filling? And may we not sometimes use stronger, more positively coloured stones for a vaulted roof? If the ribs are of a different stone, or a different colour, from the filling, at least the colour of them should merge into the ground of which they are the structural support, so that they do not unduly stand forward from it as assertive streaks. The same ideas apply to the use of bricks as stone, when we think of them from the decorator's point of view. A plastered inner ceiling, whatever be the support that carries it, may be dealt with in many ways. But it is sometimes a difficult material to deal with except we are satisfied with whitewash, which is truly most valuable. The great need, though, in using plaster, if we wish to finish the surface in a colour over the whole area, is to find some satisfactory tempera medium. By satisfactory I mean one that will not readily perish on new plaster. Or else we must perhaps seek the remedy in better plaster. If we succeeded in finding this, it would be possible, without misgivings, to do some excellent but simple colour work by finishing in blues, reds, and yellows—or rather golds—instead of being so much restricted to the adoption of the safer white and cream washes. It would be an easy matter to paint the plaster, but tempera seems the more natural medium to use in colouring it. And it is less expensive in first cost, as well as for the labour and skill required to put it on.

With a boarded ceiling there is a wide field open to us. We can paint or distemper it at will, with little fear of the results if the boards are, as they must be, thoroughly dry. I am inclined to think that we should largely discard the use of oil paint when we may, except as a preservative, where decoration is concerned ; especially in cities, where oxidation rapidly alters its colours. I am referring more particularly to cases such as those we are at present considering, that is, where the only decoration we may introduce must be a part of the necessary finish to some simple work. One reason for my saying that we should avoid the too frequent use of oil paint as a finish is because tempera, if properly used in a safe position, is more permanent. It retains the original brilliance of its hues longer, and they possess a more beautiful and transparent quality, like the freshness of water-colours almost, when used as a ground to cover large surfaces. But for highly decorative work and pictorial work, which is part of some decorative scheme, let us use every medium, every means by which we may with most security and success obtain the end at which we aim.

The roof, the vault, or the ceiling of a church—call it what you will—affords one of the best opportunities for simple decoration in colour that we can find. There is no need to make it always white. There is never any excuse for permitting it to be varnished, though it may with advantage be stained if of wood. The beauty of gold, that is, certain tones of yellow and orange, as a colour to be used as an open field of colour, all of us realise who have seen it in mosaic work. Blue, too, and red—the excellence of these we know as well. And the plain, undecorated ground is often, perhaps, more satisfactory than one which shows more evidence of design in conventional forms applied to it. Reserve in the use of colour and design is often a means of discovering better results than can be obtained by allowing ourselves a looser rein to fancy. It gives us breadth, simplicity, and dignity, as well as that much-needed quality—repose. And if we can be sure of these in our efforts we have already secured that which is most to be desired. Restless, fretting, disturbing combinations should most certainly be avoided. Abjure everything in schemes for decoration, which is more an endeavour to show your own cleverness than to make the thing beautiful for its own sake. The best works of the past were surely produced more by unconscious than conscious efforts to do fine things. They were the spontaneous products of a natural capacity.

I have spoken about the walls of a church, but not of the windows in them. These seem naturally to suggest a few thoughts apart. For they introduce the important matter of light. And in this regard we have to think of two ways by which this essential property must be provided. By this I refer to natural and to artificial methods.

Let us think of these broadly for a moment before touching the decorative opportunities they supply. There seem to be a few general principles which may be useful guides.

With little internal decoration we can dispense with clear glass in windows to a large extent, and make the glass itself, by its colour and design, serve as an important feature in the decorative scheme. But if there is much colour and design on the walls and roof inside a church, we require plenty of light by which to see it. This principle the Byzantines frankly recognised. Again, in southern latitudes, where the light is brilliant and strong, a little of it is sufficient for practical purposes. And it is therefore possible—in fact, desirable—to use very deep hues of rich colour in windows where stained glass has been adopted. In northern climates, on the other hand, we cannot so well spare light, especially in smoky cities. So the tones of colour and the proportion of white to stained glass have to be studied carefully, always bearing this idea in mind.

Other factors in decoration are the position of windows, their height from the floor, their size, and their relation to the decoration, or decorated objects, within the building. The thought of prospect does not so very much matter, as the chief reason for the use of a window in a church is to admit so much light as is necessary under various circumstances. But aspect does matter a great deal. Especially is this so in hot climates. In these, a large east window, unless it be a studded field of very deep-toned gems of colour, is most unpractical. Suppose yourselves in the body of a church and looking eastwards. Over the altar and reredos there is a large, or even a small, window, designed strictly in accordance with the traditions of northern art. It is filled with clear glass ; or with the most hideous of all things, cathedral tinted glass ; or with stained glass, thin and weak in colour. If you can see the sanctuary properly under such circumstances, and sit quietly without a positive feeling of irritation, you will be possessors of remarkable eyes. The most sensible, the most truly artistic thing to do would be, surely, to provide the actual light required by the use of side windows in the chancel, and to treat the east window, if any, as an integral part of the reredos, and to keep it in the same scale of colour tones if possible. This may not be an easy task where you are obliged to make translucent colours combine, in unity of composition, with others necessarily opaque. Obviously, too, in localities where plenty of light is always available, the windows generally may well be smaller than where nature is not so prodigal. The reason for considering the relation of windows to decoration I have already briefly urged, and some thoughts concerning their position and size have just been suggested. But what can be said about the height from the floor at which they will best serve their purpose? Here we have a somewhat troublesome question. And each individual building calls for its own solution of the problem. The character, the type of architecture imposed by conditions, largely decides such a point. For in a small country church they would not be placed so high up in the walls as in a building designed for a town, since the building should always reflect the character of its surroundings within certain limits that I need not mention. The windows in a town church approach the sky in search of the light which cannot be so well secured at lower levels. Consequently we are led to consider our decorative attempts subject to these altering conditions. Shallow saucer domes like those, say, at St. Mark's, Venice, are best lighted at their springing level, but deep egg domes are most effectively illuminated from the top after the manner of the Panthéon at Rome. The whole value of the dome of St. Paul's Cathedral as a decorative opportunity is lost internally because of its lack of an efficient eye. And where domes cannot receive a direct light by either of these methods they are likely to prove unhappy expedients so far as their decoration is concerned, though the difficulty may largely be overcome by allowing the windows near them to be filled with white or silver-toned glass.

It is necessary to attempt a few suggestions concerning the introduction of artificial light. And by artificial light I allude to that which is required to enable a congregation to see clearly. The questions concerning ceremonial lights do not call for any detailed reference in connexion with the decoration of a church. But where it is the practice to use such lights, it is certainly necessary to treat them as permanent elements with which any other illumination should not interfere. In dealing with artificial light several important things must be considered. The positions in which it shall be placed, the nature of the light available, its power, its colour, its height above the heads of the assembled people—these are the principal matters with which we should have to deal. And let us be careful to remember that artificial light may make or mar any decoration that is to be seen by its aid. If the fittings are bad you present a permanent defect to the building seen by daylight. So it is well that they should be carefully designed. There is a little room for improvement upon the vulgar commonplace stock patterns always available. But the truth is that all these fittings, as well as other furniture, should be expressly designed and made for the building in which they are to serve. They may be simply wrought and coloured, or, if the general architectural accompaniment demands it, they should be more rich in both respects.

Now the position for several points of light is not always easily decided upon. There is, however, one thing upon which, no doubt, all of us have a very positive feeling, and that is, that the lights should never be hung in a string down the centre of the nave. It ruins the architectural effect, it entirely destroys the dignity of the sanctuary, it blots out the altar and reredos, and it is not, practically, the most desirable position, for, further than those objections already stated, this method is not the most satisfactory way of equally distributing the rays. If there is an arcade the happiest position for brackets is on the east side of each pier. This to a certain extent will light the building without our being compelled to see where the light comes from, especially if some form of reflector is used to throw the rays forward towards the centre. But if there are brackets on piers or on side walls, it is necessary to keep the width of the nave, that is, the distance across from point to point, within certain limits. Standards are sometimes adopted as a method of securing an equal distribution, but they are objectionable for reasons that will follow in considering the height at which the lights are best fixed. There is another course that may well be followed, and that is to use pendants. These, whether hung out from the walls or directly from the roof, seem the least objectionable idea. For with them we can distribute the candle-power as we will, and they may be regulated in height from the floor. A useful practical position for pendants is about in a line centreing over the seating space on either side of the middle aisle. Any decoration on the walls or roof is little obscured by the glare from them in such a situation.

Of the various kinds of artificial light now available two are most commonly used ; these are electric light and gas. Of acetylene gas I cannot say anything, as it is only a new product comparatively. Candles and oil-lamps

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as general illuminators do not now command very much respect for several reasons, so it will be sufficient to confine any further remarks to the two kinds at first mentioned.

Electric light appeals to us all because of the many chances it gives of lighting a place beautifully as well as effectually. Its colour, though rather white and cold as a light, interferes but little with the colours in any decorative work—unlike the strong yellow of oil lamps which combines with and quite alters the hues in painted work. But I find from experience that the chilling feeling of electric light, always exaggerated by the use of white shades and reflectors, can be toned down so as to be quite like a lovely mellow ray of sunshine by using polished copper reflectors. An objection to the use of electric light is its piercing glare. And you can dispose of this trouble by breaking up the rays, and by carefully selecting the situation and height of the lamps. One way to combine the use of copper reflectors with an effort to multiply the rays in a pendant is to put an inverted saucer-shaped reflector over the lamp, and from this to hang by slender chains a cut-glass bowl close up under the lamp, with the whole surface facetted so that it looks like a transparent cup of diamonds.

In speaking of gas for the purpose in view my reference is to incandescent burners. And if these are used there is little to choose between it and electric light, so far as their relation to decoration is concerned. Gas is a slightly warmer-toned light than the other. But in candle-power they are nearly equal.

There is another idea that we need to consider before quitting this immediate subject. It is, too, one which affects the whole character of a decorative scheme and of an architectural composition, as much as the comfort or pleasure of any person who looks at these by artificial light; and it also helps to give dignity or suggest depression to everything that takes place in the building. And this is the level above the floor at which the lights are placed. Keep them too low, and they will blind your eyes to all things else, and make the interior seem mean, small, and circumscribed. Lift them well up at least 8 ft. above the average level of your eyes, and the building is transformed at once. It becomes open, capacious, free. It has an air of easy repose, and its size you apprehend because that which kept you in oblivion now teaches your open eyes to see.

In a church there are several objects necessary for its complete equipment. These we, as a rule, think of as the furniture. And if the person who has designed a building is not privileged also to design or select all the furniture that is required, he may at least hope that his opinion will be sought regarding it.

He conceives the church as one whole, complete with its decoration and furnishing, and if he is not permitted to have a voice in the scheme of colour and type of design to be adopted in everything down to the carpets on the sanctuary floor, it is impossible that the building *can* be made a complete work of art architecturally. To deny him this satisfaction would be the same as to ask a painter to make a picture and say that he is not to do more than group the several skeletons happily; and that any untrained ignoramus is quite able to put all the life and soul into the features of the bony faces, and clothe the bare limbs with decent, if not suitable, garments.

Yet silly as it may seem, this is frequently done by very well-meaning, but ill-advised, people, whose ardour so much outruns their discretion and their capacity. Now what is there that we may speak of as the flesh, the mind and the soul of architecture? Surely these are to be found in the mouldings, the carving, the colouring, and the furnishing. Is not decoration, then, in nature, always the finish to perfect structure? It is almost an offence to suggest such an idea, for the notion is apparent to the veriest child that will use its mind with its eyes. Therefore let us first have sound and well-studied building. And let us design it, always bearing in mind that the bones are to be in time clothed with a covering beauty—a beauty which shall never hinder nor interfere with, but rather express and more fully interpret, all that other beauty of which it is the completion. But what are some of these things grouped by us all under the term "furniture"? We know them well enough. Let me for the sake of clearness name at least some of the more important among them. Somewhere at the west there is the font, and then in the body of the building the seating. The pendants and brackets for lighting the place have already been mentioned. Then in connexion with the chancel there are the stalls in the choir, the lectern, the pulpit, a litany desk, perhaps some screens, and the organ. These have to do with that part of the chancel commonly referred to as the choir. The altar rails separate it from the sanctuary, in which is the altar itself. And within the same division are the sedilia, credence table, and piscina. Most of these particular things are considered essentials, ecclesiastically and architecturally. However, as I have said, in neither sense can the building be considered complete unless colour has been introduced, and that not only upon such furniture as these represent. Mouldings and carving we can omit entirely, but not colour. It is, of course, inevitable that it should be there in a modified way, because all materials possess it naturally; but it should be there by design as well as by occurrence.

Now, frankly, I do not quite know how to say anything helpful about the design and decoration of furniture. It is a simple matter to string together the customary phrases which are the stock-in-trade to be doled out as things at which we should aim. The best thing to say seems to be—go and look at work that has been done both in the past and the present. But for your convenience I have brought here this evening a collection of studies of old work. Among these drawings you will find studies of much of our beautiful English work, and there are others which will enable you to compare and contrast these with Belgian, French, and Italian work of different schools. There are also examples of the design and decoration of floors, walls, windows, roofs, and furniture in those various media which the artists of the past had made so completely serve all their aims and all their efforts to express their fine ideas.

The use of woven stuffs of all sorts in the decoration of churches is much in need of revival. I do not mean at all to say that this revival has not been tried. Far from it. For it has; and in the still too few cases where the art of the weaver has again been introduced to serve the needs of the Church much interesting and beautiful work has been done. I would repeat the suggestion that you should think about the Tabernacle as a typical instance of the unity of order and arrangement pointing to a unity of worship, and also to the unity of all labour. For see how the crafts joined hands under the direction of the appointed skilled artificers, and made a whole that was related in all its parts both as to idea in ritual, ceremonial, structure, and decoration. It is the example the church should follow in each respect. It points to the need of every man and each man's special capacity, but each acting in order, according to his faculty and the place he fills. It shows the mutual dependence of the arts. And the solution of many of our present difficulties depends upon the satisfactory application of this principle to the ethics of labour.

There are many instances where tapestry has been used with excellent results as a means of decoration in churches. In the cathedral at Ferrara some remain suspended between the pillars of the nave beneath the arches of the arcade. At Beauvais, in the cathedral too, the same means has been adopted as a hanging wall decoration. Though, beautiful as most of these pieces are, we may wish that they had been hung with more thought and some intention of arrangement. In the chapel of Exeter College, Oxford, the same material is used as a kind of decorative panel placed against the wall close to the chancel floor level. Now why may not this method of decorating churches be more used? It is a means by which permanent coloured work may be introduced, though it may, with some force perhaps, be urged that equally good results can be obtained by methods which do not involve the exercise of so much highly skilled capacity. It need not be always so costly as it now is if its use became more general. And we are not obliged to use figure work in all tapestries. But I am inclined to think that such a material should be used rather sparingly. As a hanging, say, behind the font, as a panel in a reredos, or as a frontal for an altar. It would look very fine, too, as a curtaining round the walls of a sanctuary. By tapestry we should mean real tapestry, not the sham material of the whole-sale furniture mart. And, above all, in using it, we must insist on having good colour, real colour, not dark, morbid heavy shades, not feeble tints; but bright, cheerful tones taken from the hints of flowers, or jewels, or sunlit clouds. Of course the introduction of woven stuffs as a means of decoration should not be used so that the building shall appear to be a mere exhibition of millinery. There may be uses, too, for other woven stuffs. Those large curtains hung in big folds with fine simple lines of curve which are to be seen as a feature of many a western entrance in Italy are suggestions of what might be done even in England. They look delightful on a hot day in the South, and merely to see the slightest breeze move them, as the hot air struggles into the cool church, is very comforting. There was one in particular, hung in the large west doorway of St. Anastasia at Verona, which always gave me intense pleasure. Its great sun-stained orange folds swaying under the tympanum of the arch, in which there was a delightful piece of figured fresco, formed the one decorative attraction in the midst of a great unfinished blank brick wall.

Where we have most adopted a kind of curtain hanging in England is in the dossal and the wings or riddles hung behind an altar to take the place of any more elaborate work, such as a reredos. Many beautiful effects have been obtained by this method. It is a simple one and need not be at all costly. And the number of materials that can be used for the purpose is almost unlimited. We need not use rich brocades of silk or velvet if we have not the means at our disposal which will procure for us the very best in these stuffs. For it should always be borne in mind that good material of its kind, however quiet, however simple, should always be used in church work. It is an offence, an insult, to offer for use there anything that is a cheap and vulgar makeshift. If the parish whose servant we are for the time being cannot give richly, let them give well, and let us provide plain, unfigured, coloured, or uncoloured hangings which shall be an honest acknowledgment of the condition and capacity to give of those who are to use the building.

Curtains, too, may be used in place of wood screens with good results if well hung and well chosen for colour.

In much modern work we may find a large and interesting series of cases where various fabrics have been used in different ways. These materials naturally retain their colour and freshness better in places out of London. But they are a convenient means by which bright and cheerful decoration may be obtained.

There is one thing further. Be very careful about the altar frontals. They become part of a decorative idea, and should therefore be designed in keeping with it.

There is much room for improvement in embroidery. And each of us can help in this by watching over its production from the making of a design and the choosing of grounds down to the selection of the kind and colour of the threads, silk or other, or the texture to be obtained by the character and direction of a stitch.

Again there is the subject—a most important one it is, too, which requires much forethought—What shall be the colour scheme in relation to lightness and darkness by which the impression or impressions at which we aim shall be produced? Shall it evoke a bright, cheery, and hearty response of delight in our surroundings? Shall it make us full of joy in the freshness of lovely beauties of colour and form, or must we submit to some sombre gloom full of suggestions of pessimistic distrust? Does the situation, does the climate, the intensity of light, or the soft mistiness of its suppression, permit us to use safely an abundance of bright or deep-toned colours, or of whites or greys? For broad groundwork we may select from a large variety of tones of some few colours. A blue or a gold ground in mosaic work is the traditional course to follow. But in cities of the North we need develop other methods than those proved of so much value by Southern experiment. And it seems natural to suggest that a white mosaic ground would be a useful one, especially for buildings in large towns where the light is rather feeble. The necessary warmth and brightness could be introduced in the decoration upon this ground. In any case, whatever may be the ground you select for a particular situation in order to secure the possession of a certain definite feeling in the whole work, you cannot do better

than take all the suggestions you can gather from old and new attempts. Drawings by other men can tell you but half-truths of the effects they see and the impressions they receive. It also is not possible for me to suggest what colours are likely to meet your need. No one man can satisfy another's taste in such matters, and only personal experience or experiment can help to decide such questions.

These thoughts seem naturally to lead us forward, so that we shall turn our attention to decoration as it may be used when applied as a partial scheme. This would mean that we should use very little figure work, but mostly conventional patterns or moulded and carved work coloured; and they also introduce ideas of a comprehensive treatment of the whole building.

Now I will take this part of the subject in a similar order to that observed before. We shall then deal with the glazing of the windows, the treatment of walls and arches with or without moulded forms, and next of roofs, ceilings, or vaults. It will be quite sufficient to say a word or two about these only, for usually the furnishing of an ordinarily well appointed church is decorative in some degree.

Windows, and the glass in them, have always been most valuable as a means of decorating, or destroying, an ecclesiastical building. They can give us the most beautiful colour it is possible to get by any artificial medium; for their brilliance approaches most nearly to that of the loveliest jewels. Perhaps this remark should be qualified. For when the most hideous possible colours that can be discovered by diseased ingenuity are put into windows, and the natural clearness and brightness of even these feeble apologies for beauty is deadened and made semi-opaque by the use of applied paint, then we know to what a degradation the sense for colour has fallen among us. The pure translucent colours of stained glass, have qualities which send a thrill of delightful sensations all through you. To see things beautiful makes us happy with a happiness we cannot explain, but it makes us reverent, and silent, and thoughtful too.

If stained glass is to be put into the windows, we should fight hard against the prevailing custom of introducing into one building a mixed collection of samples, good and bad, by a variety of designers. Let there be a unity of idea throughout the whole series connecting them together as subjects, as colour schemes, and in the general principle of their treatment as several related designs. It is quite possible to accomplish this, even though the first window may be inserted years before the series can be completed. But whatever is done let the work be stained, not painted, glass, and let the design be strictly decorative, strictly conventional, strong in line, flat, having no pictorial shading and never a shadow. Works of decorative design should never be realistic. Pictorial representations may so far approach realism as the limit of their necessarily conventional processes will allow. But decorative and pictorial work are distinct in their aims, their uses, and their methods, and let this ever persistently be recognised. It is not for me in a paper of this kind to attempt to discuss details of composition, even if it were within my province of capacity. Such a course as this would be natural in a paper on stained glass. But my purpose is to endeavour to show that the importance of all particular ideas, all special media, in one decorated building is relative, and that the attempt of a general supervision should be to keep each designer in any craft in proper subjection to the one object of the whole scheme.

It is a pardonable failing in us that we all are liable to think that our own pet and especial gift is the one redeeming glint of real brightness in a clouded sky. But what would be the value of any lighting rift if it were alone without the companion colours of all the earth and sky that you might see? Such an idea is untenable. Let each brother craft or sister art take its place, for each has a place that cannot otherwise be filled, so that the union of all may give us again the one art which is called architecture.

If we are allowed to add applied decoration to the walls and arches, let us keep the same principle of unity always still in view. And this unity is possible best when we do not, as it were, riddle and worry all surfaces with something which calls for notice. To keep a common groundwork and to show plenty of it will help to give a continuity to the prevailing idea of your scheme, or else subdue the ground and connect the related parts with a covering pattern or diaper. The two methods combined aid each other. The restfulness of a plain field, either of white or in colour, with but little applied decoration, helps to counteract the restless activity of thought apparent in the intricacies of meandering scrolls, or the repetition of one idea in spotted diapers. This is but another way of saying take care of the value of your contrasts as well as of the arrangement of lines, the contours of form, and the quality of colour. It is a pity we do not more realise to what extent we may well omit all moulding and carving if colour on the flat is taught to take the place of these. But it should take their place not as a hypocritical mimic—that would savour of theatricism—but rather as a substitute frankly acknowledged in the methods by which it is introduced.

However we may decide to act in detail, let us follow the principle already suggested and observe the uses of subjection and accentuation both in detail and in the general treatment. Above all, keep the unity of the two architectural, and the three ecclesiastical, parts of the building a patent fact. And, at the same time, let the beauty and value of the work in the chancel exceed that in the nave; and in the chancel concentrate your best efforts upon the treatment of the sanctuary as distinct from, though contiguous with, the choir. With regard to the roofs, ceilings, domes, or vaults, much that I have said concerning the walls applies to them. But as they are more removed from the ordinary eye-level they call for a larger vigour and breadth of handling. Notice how clear, how definite and firm are the lines of design in the pattern work from St. Anastasia in Verona, St. Alban's Abbey, and Chichester Cathedral. In painted figure subjects the same simplicity and readable clearness—lucidity—must prevail. The theme may call for the representation of few or many figures, but never in good work is there a single unnecessary one introduced. The endeavour is rather to compress the thought by elimination than to expand it by overgrown profusion. In the mosaic schools of the East and of Italy it was the same. Consider the self-repression, for the sake of clearness, that is evident in the decoration of Sta. Sophia and St. Mark's. Frequently there are simple figures set alone upon the groundwork, having little or no connexion with each other in design. They depend for their relation upon the idea which their attitude, position, and grouping suggest. Be epigrammatic, speak a volume in a sentence, give a life's history in a sonnet—that is the aim and the attitude that literature suggests to design. And design requires, before all things, an exercise of repression, restraint, selection; and if it has not passed through the crush-mill of your own merciless criticism, it will not stand the test of exposure to the views and tastes of other minds.

Some of the drawings here this evening will show you that I have been uttering only the commonplaces about what has been observed by others in the past. For the work of the present, you know well how it attempts, or does not attempt, to follow the same principles. Among the studies hung round the room you will find these ideas largely supported in the conclusions arrived at by our predecessors after much experiment. No good work was ever the act of one effort alone. It took years of the thought and work of many men to make it possible that the monuments of Byzantine and mediæval skill should be executed. And so will things continue.

I now invite your criticism of my suggestions—in fact, I ask for it because it will, I know, be useful. If you do not agree with them please say so, for it will help me to think them over again. If you leave me to hold some of these opinions alone it will be a satisfaction, for it is pleasanter to me to struggle with a minority than move with the flood of an agreeable multitude streaming on another course."

Mr. Corlette, at the conclusion of his paper, said he was surprised to hear that so few members of the Association were taking up the subject of colour decoration, or belonged to the Colour Decoration Class. His inclination to the study of colour received a great impetus as the result of his membership of Mr. Weedon's water-colour class. For the sake of architecture and all that that involved he hoped that more students would take up the study of colour.

The Chairman, in opening the discussion, said that he felt, whilst agreeing with the sentiment of the paper, the subject had been treated in a rather too universal manner, and that Mr. Corlette had dealt with too much at one time. It would have been better to have taken a detail of the subject, and fully considered that. He rather expected Mr. Corlette would have dealt with the subject more from a purely decorative point of view—that was to say, with roof and wall treatment. He thoroughly agreed with the first sentence in the paper as to the value of practical experience; but it must be the experience of artist and architect combined. In these days men were feeling their way back into decoration again, as had been seen at St. Paul's Cathedral, where there had been made an attempt to get the best result, although in that particular case the attempt had been a failure. The great wish of artists to get the best work was sure to make itself felt, and would show good results gradually; as, in fact, it was doing at St. Paul's, where the recent decorative work has shown improvement, though, unfortunately, still of an experimental character. St. Paul's Cathedral was not a work to experiment on; still, the last work done there is better than the first. Of course, theory did not of necessity help to produce the desired results; but the thoughtful mind, by studying colour decoration, would find the subject at once engrossing and uplifting, and by the study of such works as Ruskin's, for instance, would feel that the subject was lifted on to a higher level. Ruskin's words would help them all in the study of such an all-important subject. As architects, they must feel that one end in colour decoration schemes must be to emphasise the architectural lines of a building, or at least to keep within those lines and to make the decorative work subsidiary to them; that was to say, not to distort mouldings by colour, nor to imitate them in colour, but to treat the field of decoration within the spaces permitted within the main architectural lines. Mr. Corlette had been very severe in his remarks about tiles, which was not altogether surprising; but with tiles, as with wall decoration, plasterwork, and brickwork, there were fashions, which went in decades almost. Who could not remember the great rage there was at one time for exposing every bit of stonework and knocking off every bit of plaster—giving shameful results in some of our churches, and leaving the bare stone when it was never intended to be exposed? Then there was the great brick period, exemplified in Mr. Butterfield's work, which showed a real attempt to make use of brickwork to bring colour into our buildings; that led to exposed brickwork, and now people were showing again a rage for plasterwork. But every material was good in its way, though success or failure depended on the artist's hand that used the material; and tiles had been used very well in the past, while the late John Sedding designed some excellent symbolic tiles which were most satisfactory. It was unwise to condemn in a wholesale manner because atrocious work had been done in certain buildings. As to variety in stone, there was excellent opportunity in this country of getting, especially in Devonshire and Cornwall (where there were iron and copper deposits), a variety of colour in stone. Good effects in colour could often be got in local materials if those materials were looked for. He warmly agreed as to the great difference between decorative and pictorial art, and it was a difference which artists were not enough in sympathy with; they could not get away from the pictorial, because they painted for the Royal Academy Exhibition and other exhibitions; and they did not seem really to enter into the idea of the difference between the pictorial and the decorative. He saw a work exhibited at an exhibition some time ago which was distinctly decorative, and for that reason more distinctly outlined than the other pictures. In press notices of the work that outline was condemned, though it was that in the picture which was of the most value from a decorative point of view. That showed how little such work was appreciated by art critics. There were several causes that told against English art. Our churches throughout England were inferior from a decorative point of view to those of Italy and France, yet at one time they must, to a large extent, have been covered with beautiful colour—telling the local history and traditions of various saints, and telling it in no uncertain tones; giving symbolical reasons for all the different devout ideas held by the people of the day. Revo-

lution, in the first place, was the great and disastrous downfall of all our wall decoration. Whitewash covered it—the beautiful whitewash they had heard of that evening (it was beautiful in its own way, but not when it covered what was more beautiful of past ages). Then there was restoration, which had done, perhaps, more harm than anything else, unless it was damp. It was difficult to get any colour medium to resist damp. Mr. Gambier Parry's "spirit fresco" was, perhaps, the best material to use as a substitute for ordinary fresco or oil-painting on thick canvas. Damp in England was entirely against covering the walls of our churches with high-class decoration, while the expense of applying that decoration was very great, especially if that ideal material for wall decoration, "mosaic," was used. That was a drawback to the decoration of our walls in colour, though there was another, namely, the poverty of idea in design. It was only by the writing and reading of papers on the subject, the study of good colour drawings, and the careful study of foreign work, that we could hope to recover our former excellence in this class of work. There had been a "text" period in wall decoration, and a "symbolical device" period. In two churches he had had to deal with lately the first words that met his gaze upon entering were "How dreadful is this place," and certainly no words could more truly describe those forlorn interiors. People were too fond of symbols, and it was the vulgar repetition of them that was so trying. Church decoration was a difficult subject, but it was a subject which must be faced. Decoration must either be a pleasing harmony of colour, just put upon the walls to give pleasure to our senses, but meaningless otherwise, or be something having a far higher aim, something more helpful in itself—something educative, uplifting generally. If true art, it must be the language of the soul of the artist himself. Were they to be deprived of that noble art of painting in our churches? for it was in the decoration of those walls that one desired to see it. It was hard that prejudice and ignorance should debar us from decorating our temples in the highest way. We could not help feeling that such men as Giotto, Michelangelo, and Raphael were inspired in their work by very noble feelings, and those feelings would inspire men in all generations. Ruskin's remark on going into St. Mark's, Venice, should be remembered—namely, We went to criticise, and we stayed to worship. That explained what he thought of the influence of colour to be seen in that building. We hardly realised the uplifting power of colour; we seemed to forget the educative use of colour; and the effect of colour on our mind was lost sight of. He hoped that such papers on the subject would help us forward to a proper realisation of that beautiful art of wall decoration, and the offering to God of the best in our churches.

Mr. J. D. Crace, in proposing a vote of thanks to Mr. Corlette, said he felt inclined to agree with the remarks of the Chairman as to the large extent of ground covered by the paper. So much had been said about architecture itself that the subject of colour, or rather the colour decoration of churches, had been rather neglected. Mr. Corlette, in speaking of the works of architects of olden times, said they did great things unconsciously, and that they made no conscious effort to be great; but to be great unconsciously was only the result of an accumulation of knowledge. People did not do great things unconsciously without having the capacity to do great things, and they did not get the capacity without going through a close, exhaustive examination of their art. The old artists would almost always repay, not only drawing from, which was only half the battle, but careful consideration why they did this or that. The point was not simply that a thing was pleasing; there was always a reason for it being pleasing; and one of the most essential conditions of successful colour decoration in buildings was that whatever else it did it should help to illustrate and explain the architecture. It might add that beautiful glow and warmth only got by colour, but its function as a handmaid of architecture was to assist the architecture. Because of the diffused light of an interior, large surfaces and constructive features lost to some extent for want of shadow, and the assistance of colour was of enormous value in such cases. We were apt, in discussing the subject, to lay too much stress upon the media and the material; they were interesting in themselves, but practically they had little to do with the subject. On the subject of media, Mr. Corlette had fallen into error, he thought, in saying that the decoration of St. Albans is in distemper. The decorative work done at the time of the building of St. Albans and Norwich Cathedral belonged to the early Tudor period, and was done in oil, as many of the accounts of the time referred to the purchase of oil for the purpose. As regards the lines imitating stonework introduced into the roof at St. Albans, he was inclined to think that they were not later than the decoration, but prior. The wooden vaulting, which he believed was of the fourteenth century, was constructed absolutely in the same form as stone vaulting, and the vaulting was lined out to suggest masonry construction. Whilst speaking of distemper and oil, he must entirely differ as to the suitability of using distemper in this country, especially in great cities. In the first place, it was absorbent, and so got dirty in half the time that oil colour did. Mention had been made of using it on woodwork, but it was a most dangerous thing to do in this country, for the variations of temperature and moisture would remove it in a very short time. Treatment in gold one saw to perfection in such a building as St. Mark's. The beauty of gold was that it reflected other colours, which was one reason why it was much easier to decorate with a large use of gold than without gold, because without gold one had to think out the colour which would make other colours harmonious. Gold was a most valuable assistant in decoration. Decoration by tapestry was a very proper matter to bear in mind, but the cost was enormous. As to the use of white grounds for decoration in northern climates, in whatever material, it was hardly sufficiently realised what a fallacy it was that one could necessarily get the effect of light by the employment of white to any great extent. All decorative effect of colour was a question of management of contrast. The effect of putting white into a dark place was not to make that place look lighter but to look colder, and more effect of light was got by equalising the contrast between the dark parts and the light parts than by bringing a strong mass of cold white in one part and leaving the gloom of dark and shadow in another part. A good many rooms looked lighter and warmer with red walls than white ones. Many rooms with white plaster on the walls looked smaller and colder and less genial than when the walls were treated in deep red. The room in which they were assembled afforded an illustration of that, for when painted a sort of chromy yellow it looked smaller than it did at present. The subject was of extreme importance in relation to architecture, for no architecture could be considered altogether independent of the assistance of colour; at the same time he felt very strongly that colour should never be handled by any one who had not always in mind the structure he was decorating. It was the colourist's business to know that the architecture of a building dominated everything else. When a building had any architectural merit at all it was the decorator's business to see that his scheme did not interfere with it.

Mr. Cole A. Adams, in seconding the vote of thanks, said he felt, as every one else must feel, how little the English people knew or cared about colour in their buildings. Whether that was because of the strength of the Protestant feeling in the early part of the century, which paralysed the efforts of the decorator, he did not know, nor whether it would take a yet longer time than had elapsed since then to decorate our buildings again with colour. Although the architect might feel a need of colour in his buildings he was still bound by his clients—the parson and the general public, and he was afraid that the feeling amongst average English people was against the use of much colour in churches. Still, as architecture had made great strides during the last quarter of a century, so also was their evidence of better taste in colour, and he trusted that the study of it would be more closely followed in the future, and that architects and decorators would be more encouraged to use it by the public, and he hoped in future that the subject would be taken up by the students of the Association with greater enthusiasm.

The vote of thanks having been put to the meeting and agreed to, Mr. Corlette, in reply, said one reason why he had taken such a large field was that, as architects were far too prone, perhaps from their study of detail, to look at things from a limited point of view, he thought it better to look at the subject as one whole, and to try and realise the relation which existed between every part of the fabric and every piece of colour decoration that could be done in it; and he also wanted to suggest thoughts which would carry them away from London and from modern colour decoration. His remarks as to tiles were not intended as a wholesale rejection of them. There was a great deal to be said about them, though he was inclined to be extreme in speaking of some encaustic tiles. Perhaps his love of tempera as a medium had led him to think that more might be done with it than was possible in a climate such as we had in England, but he had protected himself to some extent by saying that the first necessity in dealing with tempera when it was to be put on wood was to have a dry material. But he thought it was possible to use tempera on a wood ground when that ground was painted. (Mr. Crace: If the paint is quite new).

The Chairman announced that the next meeting will be held on April 6 when a paper will be read by Mr. Basil Champneys on "Hints on the Study of Planning of Collegiate Buildings."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION VISITS:

THE PRUDENTIAL ASSURANCE COMPANY'S BUILDINGS.

THE fourth visit of the session took place on March 24. Old associations in the Holborn district are fast disappearing, and it was with feelings of regret to many that the demolition of Furnival's Inn was found to be an essential part of the scheme for the complete buildings for the Prudential Assurance Company.

The ultimate growth of the concern must have been contemplated when the existing building was erected, for the plan of the extension carries on the palatial system of offices in a manner suggestive of a main idea formulated in the initiatory stages. In the course of recent years the back wings have been built, leaving the south-east portion. This at the present time is in an interesting state of progress, and from a student's point of view there is much to be learnt.

The buildings embody the latest methods of the engineer's skill combined with the best efforts of the potter. The quality and finish of the materials suggest the best of everything. There is an air of cleanliness and durability only associated where glazed work and vitrifaction predominate. In this respect Messrs. Waterhouse have produced a masterpiece. An extensive courtyard is in the centre of the block, directly accessible from Holborn. The most notable feature is the approach to this. On the south side there is a great archway bridging between the two wings. Here the characteristics associated with mediævalism are brought into the design. The groining appertains to the Gothic, and carries out the principles of past ages in terra-cotta and glazed brickwork, all constructionally treated and honestly built.

There is a variety of decorative treatment, especially with regard to the colouring, to be found in the several departments. The predominating amber, constituting the tone for the principal front offices, is in pleasing contrast to the sombre colouring of some of the corridors. Externally to the courtyards the basement story is faced, with rich dark brown glazed brickwork. This gives the sub-structure an apparent strength not obtainable where white-glazed ware is used, but there is possibly a loss of reflected light in this direction.

From the drawings we note that a central tower will be the principal feature of the main front, and, with the exception of the central part, the elevation will follow the lines generally of the present work. In this respect there will be a character of completeness about the mass which would be lost if other motives and features were adopted.

Mr. G. H. Shackle, on behalf of Messrs. Waterhouse, explained generally to the members the working of the scheme and, assisted by Mr. G. Bailey, the clerk of works, he conducted them over the various departments.

FREE CHURCH, RUTHRIESTON, ABERDEEN.—A new Free Church is to be erected on the site of the existing building in Broomhill-road, Ruthrieston. The architects are Messrs. Brown & Watt, of Aberdeen.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of this Institution was held on Monday at Great George-street, Westminster, Mr. T. M. Rickman, President, in the chair.

The minutes of the last meeting having been read and confirmed, and some donations to the library announced,

Mr. J. H. Sabin read a paper entitled "The Incidence of Imperial and Local Taxation on Rateable Property." In the course of his remarks he said he was not prepared to say that the whole outcry about, or against, local taxation was justified. Much of the outlay was unavoidable, and the Royal Commission in search of information for a final report had obtained assistance to that end, and had published in Blue Book C. 9,528, 1899, a memorandum by Sir E. W. Hamilton, K.C.B., one of the Commission, and observations by financial and economic experts in reply to questions submitted to them. This publication was the text of his (Mr. Sabin's) paper.

In discussing the incidence of taxation as surveyors rather than as students of political economy, acquaintance with the relationship between landlord and tenant lead, he suggested, to this important general conclusion: that the closer the economic contact between the taxpayer and the party who can be finally made to share the burden, (1) the greater will be the proportion shifted, (2) the quicker will be the process, (3) the smaller will be the loss by friction, and (4) the higher will be the percentage of the final impost that will accrue to the rating authority. This contact was found in the closest form between owners and occupiers of fairly rented farms held under ordinary competitive conditions on yearly tenancies. One or other or both of these parties would suffer by an increase and benefit by a decrease in rates and taxes. Occupiers of houses had less in common with house owners; the process of relief from increased rates would therefore be slower, unless the extra burden be excessive and no corresponding general rise in rental values occurred. Moreover, the relief would tend to be confined to unbeneficial rates. In long leaseholds and in trade premises the interests of the parties would be more widely severed, and there would be a maximum of difficulty in transferring taxation, and the transference would be diffused. In considering the true incidence of taxation on houses we must differentiate between the buildings and the land. Together they were in law real property; in political economy the land was, the house was not; it was consumable and a commodity. "It is held, at first sight paradoxically, that an occupier of a house is the owner of the commodity, purchasing it for the period during which he pays rent; that therefore, whether taxes fall on real property or on commodities, tenants of houses have to bear taxation actually as well as apparently. But if the tenant be a purchaser of the user on a limited hire system, the article purchased is diminished in value by the impost upon it, and the vendor (the landlord) is therefore the loser in the transaction, and actually bears the tax. A tax on commodities tends to restrict their quantity or deteriorate their quality by raising the price against the buyer. Houses are subject to this restrictive tendency, and so, too, is that part of the raw material required for their erection represented by their sites, which has to bear a share of taxation levied upon house and land together. While, therefore, a tax falls on the occupier, it is shifted backward in degrees to the house-owner, and through him to the land-owner if there be a third party, subject, of course, to the limitation that the process is blocked by a contract between any two of the three parties, and that the tax loses its weight in the process. But I am satisfied that in practice farm houses and buildings do not come under the law usually affecting commodities in any sense whatever, even if other trade premises do. . . . The answer to this fifth question [one of the questions submitted by the Commission to the sixteen experts consulted] is, therefore, that the real incidence of taxation on rateable properties differs according to the character of the property, and that uniform alterations in the methods of rating or in the collection of taxes would affect different owners and occupiers in entirely different ways." The author then considered the sixth question and its sub-question: "What is the real incidence of the Inhabited House Duty?"

"That a house-tax diminishes the demand for sites," he said, "is borne out by experience in provincial towns; it scarcely applies in London. In such towns sites for houses below the exemption figure are saleable and fetch higher prices than sites for higher rented houses, and this, I think, quite apart from any other considerations . . . . not only have the great bulk of the people to consider how much they can spend in rent, it is also widely true that with a similar proportion of the population, after a certain standard has been reached, wages and salaries do not increase uniformly with the growth of families, and that there is in such cases a fixed income and a growing need for room. In cases quite numerous enough to affect our conclusions, the house tax, therefore, falls under the category of imposts which the owner may have to share, because occupiers will be driven, by necessity for more rooms, into other localities where circumstances permit of houses being provided at cheaper rates. Owners both of houses and of land benefit, therefore, by remission, although part is appropriated by the occupier. All parties would lose by an increase. The freeholder, of course, will neither gain nor lose if he be a mere rent-charger, but in respect of land to be marketed, freeholders in general would gain or lose in price, or rental, a part of the tax remitted or imposed. We are justified, therefore, in inferring that owners do bear part of a tax levied upon land applied to a specific use, such as building houses. Sub-question (B) makes the same inquiry as to *rates* on houses and trade premises. . . . In London we are (1) greatly under the influence, benignant or otherwise, of the leasehold system, and (2) possess, much more acutely than in other cities, certain districts which are, as it were, centres of gravity for values. At such centres there is an absolute monopoly of a certain quality of building space. Monopolists cannot transfer to others the whole of a burden primarily laid upon them or their, and this will follow:—The rents of sites and of houses at such points as Threadneedle-street and Grosvenor-square will be *enhanced* by the fact that only the most profitable businesses and the richest tenants can pay the rents that can there be demanded; they will be *reduced* by a proportion of the rates and taxes attaching to the limited area included in the monopoly, reaching practically the whole at the centre. As such centres are receded from, centrifugal force is exerted, and values diminish until the limit of building is reached. At or beyond the limit, the land, as regards building value, is stricken with sterility; inside the limit the owner will have the potential value reduced by no more than the proportion of the tax on the ground value. Outside the limit entirely new conditions arise. Let us start from this outer rim, where land is ripe for building. What occurs to the intending lessee or speculative purchaser? . . . . Will not a builder, like all wise dealers in commodities, endeavour to cater for his customers in the matter of building houses as keenly as a Tottenham Court-road tradesman in furnishing them? Both will be prepared to consult the pockets of their customers in regard to price. Norwich, owing partly to special conditions affecting a large area of land in its outer circle, was until quite recently held in bonds. These shackles have fallen off, and there has also been a rapid development of industries requiring comparatively low-skilled labour. The consequent demand for houses of a particular class has been met by the erection of dwellings bearing the minimum amount of rates that can be contrived by compounding. Notwithstanding abnormally high rates, Norwich has thus had secured to it houses above the level of the accommodation enjoyed by similar workmen in many other manufacturing towns. Land will sell for such houses more readily than for houses that cannot be compounded for. I assume from these facts that the landowner bears at least a portion of the rates, and is benefited by the ability of the houseowner to reduce the rates by compounding. Neither land nor house owner would absorb all of a total remission; the occupier would get part owing to competitive action, and a landowner who had new sites to deal with would get some part. Practice, I therefore think, supports the view held by Professor Edgeworth and others, but not those of Mr. Gomme, who suggests that all local expenditure may without injustice be charged upon owners of site values, because land under economic laws naturally bears all rates. To the extent that rates are equal in amount and in purpose, the inferences are that the result is equal everywhere, but the equality of result is not the same when rates are unequal in amount or in purpose. Beneficial rates and rates above the normal average affect localities in different degrees. Generally speaking, beneficial rates, we may agree with Professor Edgeworth in saying, will not drive people away, but differential rates will, or will tend to; and we may add that if people do not actually forsake a district, it may be safely assumed that the extra pressure has found an outlet. Take Norwich again. The rates are high and largely unproductive, being the result of past unprofitable outlay. Yet it has had an abnormal increase of population considering its situation in an agricultural county. It has just burdened itself with further outlay for street improvements and new sewerage. The extra pressure has fallen on owners. Increased trade has brought back values of houses in the city, and the depreciation caused by heavy rates has been recovered, but owners of land have to accept less than the normal value. . . . It would be idle to assume that rates for real services all equally fall on the houseowner or landowner. It requires a stretch of imagination to admit that the cost of cleaning the streets of snow has become a rate falling entirely on owners because an Act of Parliament has relieved the occupiers of the normal duty of keeping his own doorstep clean, and placed it upon the Local Authorities. Yet it is clear that if the duty had been placed upon one parish and not upon another, the tendency would have been to depreciate the value of houses in the extra rated parish, unless—a very unlikely case—the whole management of the parish was so good as to attract cleaner and more respectable occupiers prepared to pay for the benefits. It may be, too, that in some districts a free football ground would be deemed worth paying for, and in others that a free library was of value. I believe it is therefore safe to assume that, apart, of course, from so-called 'rates' for water and other purely valuable services, payments for benefits do not immediately or always affect rents, and that they should not, being properly occupiers' charges." The author then dealt with taxes on traders or trade premises; rates on farms; and the questions, "Should local rates be divided between owners and occupiers, and, if so, in what proportion?" and "Should ground values be separately rated for local purposes, and, if so, on what principles?"

"Apart from rating purposes, two reasons," he said, "are urged for a separation of site values. First, to remedy an injustice in regard to deductions for repairs where the ground rent is an appreciable part of the value. At present premises rated at say 900*l.* a year gross, with a ground rent of say 300*l.*, receive an allowance of one-sixth, and are rated net at 750*l.*; whereas the building alone being subject to decay, and the sixth being a maximum allowance and always granted, the reduction should be on 600*l.* only, and the net be fixed at 800*l.* Such a method of adjusting inequalities that will occur to any of us would not of itself be unfair, and would be preferable to an invidicus and expensive examination of premises for the purpose of determining what should be allowed in each case — a method that would put a premium on neglect and make dilapidations remunerative. Secondly, it is proposed to place site values on the rate list to secure a remission of house duty on that part of the total annual value; inasmuch as a house duty becomes an onerous land tax when levied in respect of anything more than the house itself. However desirable this remission might be, it would clearly not be consistent with the views of those who desire to see the site value taxed *per se*. If the house duty were transferred to Local Authorities there would be less reason for this separation, as relief would be given to this extent to local charges, and the proportion chargeable to sites might be deemed to be a tax on ground values. But what are ground values? They are not necessarily the rents reserved under building leases. A ground rent may be much more than the ground value—including a first charge on the building; or it may be much less—excluding some portion that has been capitalised. Lessees may have sufficient reasons for demolishing houses good enough for ordinary purposes and substantial enough to secure an adequate rent to the freeholder, and there may be erected thereon a palatial edifice for the site of which the freeholder will require a rent almost equal to the rack rent of the demolished houses. To

call such rent a ground value would be absurd. I do not think it would be impossible to get a definition, but to be placed on the statute-book it must be one that shall be self-contained, and that may indicate an amount independent of, but not necessarily dissimilar from, any payment disclosed by a lease. In some cases an ideally just value would not be reached, but it would not be impossible to attain one that would answer the purpose. With regard to new ground rents or site values under new contracts, it seems to me impossible to escape the conclusion that their direct assessment would relieve the lessee of so much of the rates as would naturally attach to the rent, and that, therefore, the lessor could claim an equivalently higher rent. Where it is possible to localise a benefit, I see no reason why the entrant into advantages secured at public cost should not be required to contribute thereto, but this is an entirely different proposal to that which would levy a rate on those who had not benefited and who might have already incurred all necessary outlay. Again, it would be inconsistent and unjust to place on the rate book vacant building land kept out of the markets partly by reason of rates that rendered it sterile. This, with cognate questions, is still receiving the attention of the Commission, and will, I have reason to believe, form the subject of further memoranda. It is alleged that rating would force land into the market, but there is melancholy evidence in the suburbs of unsuitable land being artificially forced into the market in past years. If some of the swamps of Canning Town and Barking had not been prospected as building land, the serious difficulties presented by East London problems would not be with us. Is there any logical difference between coercing an owner in respect of breadth of user and coercing him in respect of height of user? If there is none, why should not owners of suitable sites be compelled to let them for artisans' dwellings six or eight stories high, and so avoid the necessity for the intervention of Local Authorities?"

The author then referred to the principle of deductions from rents of the whole or portions of rates, and the possibility of reaching a site owner through the occupier by permitting such deductions as in the case of income tax; the methods of raising and repaying loans; and concluded with some general observations.

On the motion of Mr. Dudley Clarke, seconded by Mr. Willis Bund, a vote of thanks was accorded to the author, and, on the motion of Mr. P. E. Pilditch, the discussion of the paper was adjourned until the forthcoming meeting at Leeds.

THE NEW WORKS OF THE METROPOLITAN ELECTRIC SUPPLY COMPANY AT WILLESDEN.

THE Metropolitan Electric Supply Company —which, judging by the area it serves and the number of lamps connected on to its mains, is the most important supply company in London —acquired an unenviable notoriety at the end of last year by shutting off the supply from some of their consumers at the hours of maximum demand. The new power station, however, which the company has opened at Willesden, will now prevent any of their sub-stations from being unduly overtaxed. As this station contains many new departures in electrical practice and is probably the forerunner of many others on similar lines, a short, detailed description may be of interest.

Some fifteen years ago it was suggested that the power station of an electric supply company should be situated where coal and water were cheap, and that the power should be transmitted at high pressure to distributing stations in the area of supply. The London Electric Supply Corporation acted on this theory, and built their power station at Deptford, nearly twelve miles from the distributing station in Trafalgar Square. Owing to unexpected difficulties in the transmission of power at such high pressure this scheme very nearly failed, but from the point of view of other companies it was a most instructive experiment, and they are now beginning to profit by the experience gained.

The site of the new works of the Metropolitan Company is situated partly in Willesden and partly in Acton and has an area of eight and a-half acres. A siding connects the company's coal stores with the London and North Western Railway, and it has a wharf on the Grand Junction Canal which bounds it on one side. The branch line also, which runs from the Midland Railway's Brent coal-sidings near Child's Hill to Gunnersbury, forms another boundary. It has, therefore, great facilities for getting coal at the lowest rates.

The works when finished will consist of two long parallel boiler-houses placed on each side of the engine and dynamo-house. The length of all the houses will be 384 ft., and the breadth of the engine-house 112 ft., and of the boiler-houses 88 ft. each. There will be four chimney shafts, each having an internal diameter of 13 ft. 6 in., and being 165 ft. high. The completed works will have a capacity of 45,000 horse-power, and will be capable of lighting 810,000 eight c.-p. lamps at one time, or, making the usual allowance, they will be capable of supplying 1,620,000 lamps.

In the engine-house there will be eighteen 2,500 h.-p. engines of the vertical compound type which will be directly connected to eighteen two-phase alternators. The foundations for the bedplates of the engines and dynamos have, therefore, had to be made particularly strong, and are embedded in a mass of concrete 19 ft. thick. The bearings of the engine are very massive, 14 in. in diameter and 42 in. long, and are made of cast iron lined with white metal. They are low speed engines, making about 116 revolutions per minute, and they are self-governing in practice to within about one per cent. At the present time only three self-contained sets consisting of engine, dynamo, and exciter are working, but three more are in process of erection. These three, however, could by themselves supply nearly half of the present load of the company, which is just over 500,000 lamps.

In the boiler-house there are sixteen Babcock and Wilcox water-tube boilers, eight on each side, and most of the firing and stoking is done automatically. The coal is conveyed in hoppers from the barge or the truck to the furnaces by a Temperley transporter, and Vicars's automatic stokers are employed. The ashes also are removed by means of the hoppers.

The transmission is at high pressure, the same pressure as the London Electric Supply Corporation have used to transmit energy for the last ten years between Deptford and London being employed, namely, 10,000 volts. As it has been wisely decided not to generate the current at this very high pressure, transformers have to be used at each end. The dynamos are two-phase, and give off their currents at only 500 volts. They are then carried by mains to a separate building, where all the high tension transformers are banked. These transformers, which were invented by Mr. A. F. Berry, have an extraordinarily high efficiency. An efficiency of ninety-nine per cent. has been obtained at favourable loads, so that the two or three per cent. loss is a small price to pay for the great increase in the safety and convenience of working. The high pressure cables are carried underground in five-way cast-iron conduits, in which there is room for the extra cables which will be required in the future. The route chosen to the first distributing station, which is at Amberley-road, is the towpath of the Grand Junction Canal. Afterwards the conduits are taken under the streets to various other stations and distributing centres of the company. The Sardinia-street and Whitehall-court works are the only ones not yet connected, but the main to Sardinia-street will soon be completed.

Some soreness has been felt by manufacturers in this country that the dynamos and engines have come from America, but the Americans were the only ones who could promise delivery within the required time. We understand that Messrs. Willans & Robinson have turned out engines as large as those supplied by the Westinghouse Company, and that their books are filled with orders for similar machinery. Again, English manufacturing electricians are turning their attention to polyphase machinery, the theory of which is now thoroughly understood. The only criticism we can offer of the design of the works at Willesden is that two-phase and not three-phase machinery is adopted. We have seen it stated that this was done because of the difficulty of balancing the three-phase mains. This reason shows an entire misconception of the regulating power of the three-phase transformer, and if no better reason is forthcoming some thousands of pounds have been wasted in the mains.

We learn that since the new machines have come into operation there has been no breakdown in the supply over the entire system. The company seems to be thoroughly alive to the magnitude of the task it has undertaken in offering to supply four or five square miles of a populous and wealthy district in London with the electric light. It is too early yet to state that all their troubles are over, but they can look forward with confidence to the future.

THE BUILDING TRADES' GIFT:

HOMES FOR DISCHARGED SOLDIERS.

MR. T. F. RIDER, as Honorary Secretary of the Building Trades' Gift, has much pleasure in announcing the following additional lists of contributions and subscriptions:—

Additional Subscriptions.

	£	s.	d.
Mr. Edwin O. Sachs	200	0	0
Messrs. Holland & Hannen	52	10	0
The Arlesey Brick Company (Bearts), Limited	50	0	0
Messrs. John Bazley White & Brothers, Limited	50	0	0
The Executors of the late Henry Ryden, (Highbury)	50	0	0
The Workmen of Messrs. Holland & Hannen	40	16	8
Messrs. Baily & Sons	25	0	0
The Workmen of Mr. Thomas Boyce	16	18	10
The Office Staff and Workmen of Messrs. Robert Boyle & Son, Limited (London and Glasgow Branches)	13	10	0
The Workmen of Messrs. A. Kellet & Sons, Limited (per Mr. J. Kershaw)	11	5	3
Mr. William Benson (Newcastle-upon-Tyne)	10	10	0
Messrs. Ernest Matthews & Co.	10	10	0
Messrs. A. & W. T. Richardson	10	10	0
Builders' Clerks' Benevolent Institution	10	6	1
Mr. T. W. Ide	10	0	0
The General Iron Foundry Company, Limited	5	5	0
Mr. Thomas Boyle	5	5	0
Mr. J. Hubert Podmore	5	5	0
Mr. R. J. Wells (Barton-on-Humber) (Per *The British Clayworker*)	5	0	0
Mr. Alfred Lockhart	5	0	0
Mr. Herbert Falkner	5	0	0
The Workmen of Messrs. Strode & Co.	5	0	0
Mr. John Soper	3	3	0
The Workmen of Messrs. J. Tylor & Sons	2	10	0
Mr. Walter Markham	2	2	0
The Workmen of Messrs. Veitch & Close	1	16	0
The Workmen of the Mosaic Manufacturing Company	1	3	0
Mr. W. A. Hudson and Workmen	1	1	6
The Workmen of Mr. A. W. Turnbull (second donation)	1	0	0
The Workmen of Messrs. Humphreys, Limited (fourth donation)	0	15	0
The Workmen of Mr. William Murray (Epsom)	0	8	3
The Workmen of the Berkefeld Filter Company	0	3	6

Additional Contributions in Kind.

Messrs. Chas. Nelson & Co. (Rugby).—30 tons blue lias lime.

Mr. W. J. White.—10,000 red facing bricks.

Mr. Alfred S. Tucker (second gift).—Chimneypiece and stove.

The Waltham Art Metal and Engineering Co.—ornamental covers for electric light pushes and bell-pushes.

Messrs. A. C. W. Hobman & Co.—artificial stone to the value of 20*l.*

The Chester Engineering Co. (Chester).—Six large patent casements for connexion corridors.

Messrs. James & Son.—The inside blinds for the recreation house.

Messrs. Long & Coles.—Wrought ironwork to the value of 25*l.*

Messrs. Bradshaw & Co.—The asphalt for roofs and footways.

Mr. Samuel E. Spencer.—Art metal work to the value of 5*l.*

Messrs. Lancaster & Co., one 450-gallon cistern and one hot-water cylinder.

The Lambeth Brass and Iron Company (per Mr. John F. Bolding), steam barrel and fittings.

The Phœnix Lead Mills (per Mr. John F. Bolding), lead pipe, soil pipe, bends, traps, junctions, and tacks for one home.

Messrs. Rufford & Co. (per Mr. John F. Bolding), two baths.

Messrs. W. B. Bawn & Co. (per Mr. John F. Bolding), one tank and cylinder.

Messrs. W. Harland & Son, Merton, Surrey (per Messrs. Wilson & Stockall).—Twenty gallons of enamel.

Messrs. A. Emanuel & Sons.—Two porcelain baths, four water-closets, and four lavatories, all complete with fittings.

Messrs. A. H. Lavers, Limited.—The whiting for the whole of the homes.

Messrs. Lamigeon & Co.—Ten sacks marble cubes for mosaic.
Messrs. A. & J. Main & Co.—Wire fencing to the value of 20*l.*

In our last issue we mentioned that Messrs. "E. R. Burt & Sons" had made a gift to this fund. The name should have been "Burtt."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring Gardens, Mr. W. H. Dickinson, Chairman, presiding.

Loan.—On the recommendation of the Finance Committee, it was agreed to lend the Shoreditch Vestry 70,000*l.* for electric lighting purposes.

Rates of Wages and Hours of Labour.—The same Committee reported as follows, the recommendation being agreed to :—

"By agreement between the Master Builders' Association and the National Association of Operative Plasterers the rate of wages of plasterers has been increased from 10d. to 11d. per hour. It is therefore necessary that the Council's list of wages and hours of labour should be amended in this direction, and we recommend: That the Council's list of rates of wages and hours of labour be amended by increasing the rate of wages of plasterers from 10d. per hour to 11d. per hour."

Street and Traffic Regulations.—The General Purposes Committee brought up a report containing the following paragraph, the recommendation at the end of which was agreed to :—

"The Council on December 20, 1898, passed the following resolution :—'That it be referred to the General Purposes Committee to consider the desirability of convening a meeting of the representatives of the City Corporation and the Vestries and District Boards for the purpose of considering the following matters relating to streets and street traffic, viz., (*a*) the best method of removing house refuse—(1) the best kind of portable receptacle for use by householders, and (2) the best contrived vehicle for the conveyance of house refuse through the streets so as to avoid nuisance; (*b*) the best method of cleansing and sprinkling the roads; (*c*) the best means of preventing, so far as possible, the casting of objectionable litter or dangerous substances in the streets; (*d*) the best method of indicating the names of thoroughfares, not only at the ends, but at the intersection of streets; (*e*) to suggest better regulations for the further suppression of street cries, railway whistles, and other objectionable and unnecessary noises within the area of the metropolis; (*f*) to suggest better police regulations for the protection of the public while building operations contiguous to foot pavements are being carried on; (*g*) to suggest police regulations for the disuse of vans and carts so constructed with blind hoods as to prevent drivers from seeing passing vehicles, to the common danger of vehicular traffic; (*h*) to consider if it is practicable to make further arrangements for slow traffic; and (*i*) to suggest more stringent police regulations so as to prevent serious hindrances to vehicular traffic occasioned by prolonged and unnecessary stoppage of vehicles at the sides of crowded thoroughfares.' We have given careful consideration to the subject matter of the reference, and have come to the conclusion that a useful purpose would be served if a conference were held for the purpose of discussing the question of effecting improvements in the present regulations of the matters referred to. We accordingly recommend—'That the General Purposes Committee be authorised to arrange for a conference at the offices of the Council with representatives of the City Corporation and Vestries and District Boards, for the purpose of considering the matters set out in the resolution of the Council of December 20, 1898.'"

Widening of West-hill, Wandsworth.—The Improvements Committee recommended, and it was agreed, that the estimate of 11,750*l.* submitted by the Finance Committee be approved, and that, subject to the Wandsworth District Board agreeing not to oppose the Council's present or any similar scheme for the construction of a light railway or tramway from Clapham to Putney, the Council do give its statutory consent to and do contribute on the usual conditions one-half of the net cost of the widening of West-hill to 54 ft., between the police-station and Santos-road, proposed to be undertaken by the Wandsworth District Board, such contribution not to exceed the sum of 11,750*l.*

Acquisition of Tramways.—The Highways Committee reported on the acquisition by agreement of tramways in Waterloo-road at a cost of 6,000*l.* They recommended that, subject to the South London Tramways Company obtaining from the Board of Trade the necessary consent, the Council agree to the purchase for 6,000*l.* of that portion of the company's undertaking between St. George's-circus and Waterloo-road, near the terminus of the London and South-Western Railway.

The Council agreed to the recommendation.

Old Gravel-lane Bridge, St. George-in-the-East.—The Improvements Committee recommended, and it was agreed, that the estimate of 14,000*l.*, submitted by the Finance Committee in respect of the reconstruction of the swing-bridge over the London Dock-cut at Old Gravel-lane, be approved.

Alterations, &c., Shadwell Fire Station.—The Fire Brigade Committee reported as follows, the recommendation being agreed to :—

"We have had under consideration the three tenders referred to us by the Council on March 13 for the execution of certain alterations and repairs at the Shadwell station. The tenders are as follows :—Messrs. Vigor & Co., 1,836*l.* 10s.: Messrs. F. & F. J. Wood, 1,998*l.*; and Messrs. Holloway Bros., 2,136*l.* Five other firms were invited to tender, but did not do so. The lowest tender is informal, the detailed prices on which the estimate is based not being inserted. We may remind the Council that tenders were, on our recommendation, invited from selected firms because the manager of works reported on January 18, 1900, that he was not satisfied of the sufficiency of the architect's estimate. That estimate amounted to 1,476*l.*, plus 10*l.* for stoves, and it will be seen that this is considerably below the lower of the two tenders which are in proper form. We are not prepared to recommend the acceptance of either of these two tenders. The bulk of the work is of the nature of jobbing work which would have to be carried out at some inconvenience to contractors owing to the premises being occupied, and we understand from the architect that he does not now think that full regard was had to these points when his estimate was prepared last December. The manager of works is prepared (notwithstanding that since his estimate was made the wages of plasterers have been increased, and the prices of some materials are rising) to carry out the work for the amount which he quoted to us on January 18, viz., 1,716*l.*, and under the circumstances we are of opinion that the work should be entrusted to him at that figure. The work will be specifically provided for in the estimate for the next financial year. We recommend—That, subject to the passing of the annual maintenance vote for 1900-1, the alterations and repairs required at the Shadwell station be executed by the Council without the intervention of a contractor; that the Council do sanction for the work an expenditure of 1,716*l.*, with 10*l.* for stoves; and that the specification, quantities, and estimate of 1,716*l.* be referred to the manager of works for that purpose."

The Council, having transacted other business, adjourned.

METROPOLITAN ASYLUMS BOARD.

A MEETING of this Board was held at the new offices, Thames Embankment, on Monday afternoon, Mr. Edward White, L.C.C., presiding.

Joyce Green Hospital.—The Works Committee reported the receipt of six tenders for the erection of Joyce Green Hospital, namely, Leslie & Co. (Kensington), 222,450*l.*; Patman & Fotheringham (Islington), 227,500*l.*; C. Wall (Chelsea), 228,350*l.*; McCormick & Sons (Essex-road), 228,822*l.*; Spencer, Santo, & Co. (Earl-street), 234,250*l.*; and Martin Wells & Co. (Aldershot), 259,580*l.* The architects' revised estimate was 233,102*l.* This was, however, exclusive of certain works already executed (including a tramway from the river, external fencing, gas mains, &c.), and amounting in value to 6,736*l.*, and of certain other works amounting to 10,317*l.*, which had still to be carried out, and for which tenders would be submitted to the Board for acceptance in due course. The Committee added that the hospital was designed to accommodate 940 patients in thirty-two pavilions of forty beds each, with isolated accommodation for sixty patients. The work now proposed provided for the erection of ten of these pavilions, and of isolation accommodation for thirty-six patients, together with the erection of the whole of the administrative accommodation and of a small ambulance station. It also provided for the construction of the foundations of the remaining twelve pavilions and of the remaining isolation blocks. The cost, apart from the building contract, would amount to 34,641*l.* The Committee formally recommended that, subject to the consent of the Local Government Board, the tender of Messrs. Leslie & Co. be accepted.

This was adopted.

Grove Hospital Tenders.—The Works Committee reported the receipt of twenty-eight tenders for the equipment of Grove Hospital. It was resolved to accept the lowest, that of Messrs. John Green, of Chester Gate, Stockport, for 714*l.* 7s. 8d.

ARCHÆOLOGICAL SOCIETIES.

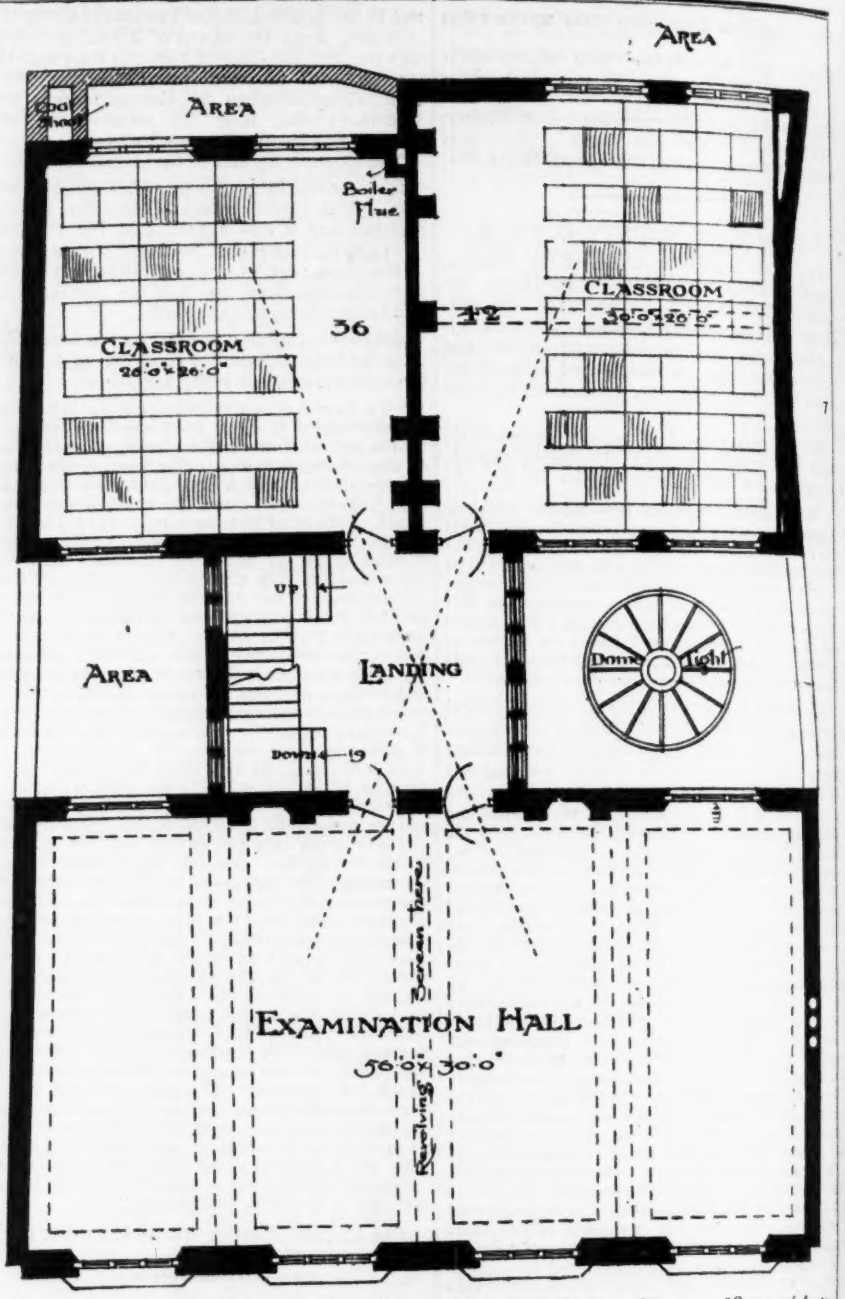
ROYAL ARCHÆOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.—The annual meeting will be held at Dublin, from Wednesday, July 18, to Wednesday, July 25.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting held on the 21st inst., Mr. Chas. Lynam, F.S.A., hon. treasurer, in the chair, the Rev. H. J. Dukinfield Astley, editorial secretary, exhibited, gave an account of, and read some extracts from, two ancient registers of the Parish of Sydestone, Norfolk. A paper was also read by Mr. Edward Lovett on "Title Records and Accounts by Wooden Tallies." The author showed the connexion between modern customs and the ways of primitive man in the use of tallies, not only in Europe, but in all parts of the world. A full and interesting description of the hop tallies was given. The paper was illustrated by many examples of "tallies"—lamb tallies, fish tallies, hop tallies, and some bakers' tallies, still used in France, which are notched on a hazel stick. These "tallies" are all split in such a way that no other than the counter part can possibly fit the notches, therefore the record is absolutely true and forgery is impossible.—In the discussion following the paper Dr. Winstone, Dr. W. de Gray Birch, Mr. Gould, Mr. Compton, Mr. Astley, and others took part. Mrs. Day exhibited a little book, in admirable preservation, entitled "Basilikon Doron, or his Majestie's Instruction to his Dearest Sonne, Henry the Prince," at London, 1603.

SURREY ARCHÆOLOGICAL SOCIETY.—The annual meeting of this Society was held at the Castle Arch, Guildford, on Saturday, March 17. Viscount Midleton, the President of the Society, occupied the chair, and moved the adoption of the report and balance-sheet. The report stated that the Council of the Society had much pleasure in submitting this, its forty-fifth annual report, together with the cash account to December 31, 1899. The catalogue of church plate is still being continued by the Rev. T. S. Cooper. The Society's new premises at Guildford became available for the use of members on Saturday, March 18, when the annual meeting was there held. To the interest taken in the museum since the opening abundant testimony can be found in the large number of attendances both of members and others. The Council has to express its best thanks to all those who have during the year so greatly enriched the contents of the library and museum by their kind gifts or loans. Amongst the gifts, it desires to draw attention to one from Mr. Julian S. Corbett, of the Manorial Court Rolls of Imber Court; and to one from the executors of the late Mr. Manwaring Shurlock, of a number of interesting relics from Chertsey Abbey; both which it considers of a nature to give an especial value to the Society's museum, and to enhance its position in the county. The contributions to the Guildford Museum Fund have reached a total of 273*l.*, at which amount the fund has now been closed. The Council's thanks are due to all those whose generosity has helped to produce this total. It is proposed to issue the balance-sheet of the fund next year, with the report for the current year. Under the direction of the joint honorary secretary, the Rev. T. S. Cooper, the excavations at Waverley Abbey were continued last summer with excellent results. The work was practically confined to the infirmary block. Here, as had been anticipated, sufficient remains of the walls were found to determine the position of the infirmary hall and chapel, the misericorde, reredorter, kitchen, &c. The most important find has been, however, in another direction. This was the discovery of the little presbytery of the original Norman church, which was made use of in the south transept of the later church, and formed the divisions of two of the chapels there. The Society has been fortunate in securing the co-operation of Mr. Harold Brakspear, who has made an accurate and instructive ground plan of the present state of the Abbey. It is hoped that the excavations may be continued during the coming summer under the same direction as hitherto, and, given fair weather, the com-

pletion of the work should be within measurable distance, if the funds at the Society's disposal will permit. For these latter, however, the Council is now again compelled to appeal for subscriptions. The Council has very great satisfaction in being able to report that the small deficit shown in the accounts for 1898 has now been wiped off, and that in place thereof the Society, with no liabilities to meet, had at the end of last year a balance of over 40*l.* in hand. Towards this result, the economies which it was mentioned in last year's report were likely to be effected in future years have to some extent contributed, but it is again chiefly to the very considerable increase in the number of members that the Society is indebted for its improved financial position. In view of this position, the Council has decided to issue to members during the present year a complete bound volume of the collections, and hopes to be able to continue this in future years. It must, however, impress upon members that its ability to do so entirely depends upon their success in enlisting the interest of their friends in the Society's work, and in not allowing the number of members to fall below its present standard. The Council regrets to report the death of Mr. Thomas Somers Cocks, who had acted as treasurer and one of the trustees of the Society from its commencement. To fill the offices thus vacant Mr. Cocks's son, Mr. T. S. Vernon Cocks, has been duly elected. Lieut.-Colonel E. Z. Thornton has resigned his seat on the Council; Dr. W. E. St. Lawrence Finny has been duly elected to fill the vacancy. The number of members is 368—viz., annual, 272; life, ninety-five; honorary, one. During the year, sixty-three new members have been elected—viz., sixty-one annual and two life. By death the Society has lost ten members—viz., eight annual, two life; by resignation, eight members; total, eighteen; gain over loss, forty-five. The Rev. T. S. Cooper, finding that, owing to his probable absence from the country for the greater part of the year, he will in future be unable to give the time and attention that the work requires, will not offer himself again for re-election as one of the honorary secretaries. The Council desires to express its great regret for the loss of Mr. Cooper's services, which have been of great value to the Society.—Lord Midleton, in support of his motion, especially referred to the excavations that were now proceeding at Waverley Abbey, and said many interesting features were being brought to light. It was often supposed that Cistercian abbeys were built precisely on the same plan, but these excavations had shown that, although the general plan might be the same, yet at Waverley, at all events, there were very considerable variations, some of which were of great archæological interest. He also spoke of East Clandon Church, which had been until lately entirely neglected, and was now in process of restoration, thanks to the interest that had been taken in it by a recently-elected member of the Council, Mr. Frank Eastwood. The matter had been placed, fortunately, in the hands of Mr. T. G. Jackson, R.A., architect, and who had been lately appointed (on the death of Sir Arthur Blomfield) diocesan architect. Several very interesting features had been discovered in this church; among others he might mention was the excrescence that was formerly used as a family pew by the Sumner family, and which was afterwards converted into a vestry, and had had its roof lowered nearly one-half; this now turns out to have been really an old transept of the church.—Sir Cuthbert Peek seconded the adoption of the report, which was carried unanimously. The retiring members of the Council, Lieut.-Col. Godwin-Austen, the Hon. G. C. Brodrick, and Messrs. E. Foster, Robert Hovenden, Mill Stephenson, A. J. Style, J. Watney, and Rev. T. S. Cooper, were re-elected. Lord Midleton proposed the re-election of Mr. Montague S. Giuseppi as hon. secretary, with a vote of thanks for his very energetic services, which was adopted. Messrs. Cecil T. Davis and W. F. Potter were re-elected auditors. Plans were exhibited to the meeting showing the further excavations being carried out at Waverley Abbey, and a map of Kingston in 1813, reproduced by Mr. Spratt, was presented to the Society by Dr. Finny.

APPOINTMENT OF SANITARY INSPECTOR.—The Local Government Board have sanctioned the appointment of Mr. H. J. Warwick as a Sanitary Inspector in the parish of St. Pancras.



Design for Bristol School Board Teachers' Centre. Plan. [See next page.

Illustrations.

SOME MODERN LEADWORK.

THE attention which is being again paid to the capabilities of lead for decorative treatment is very gratifying, and may be considered to amount to a kind of revival of a forgotten art. Time was when few things made of lead were turned out without the maker taking the opportunity to impress upon the metal some ornamental device which would give charm and interest to his work; the utilitarian cistern became the frequent field for this enjoyable craft; the lead spout-head was a thing of beauty and interest. For more than a century all the impulse to do this kind of work seems to have gone to sleep; lead became a dead surface. Within the last few years the opportunities which leadwork presents for a special kind of decorative treatment, differing from that suitable to other metals, have been once more recognised by at least a few architects and craftsmen, who will doubtless be followed by others.

Of the nine examples here shown of modern leadwork the central one, No. 5, is a finial cross made by Mr. F. Troup and Mr. Dodds. It is, however, not quite complete, as there should be, or are to be, decorative bosses on the small circles on the centre stem and the circle.

Nos. 1 and 2 are two views of a font basin, intended to stand on a stone octagonal pedestal. It was designed by Mr. H. Wilson, modelled by Mr. A. Grove, and cast by Mr. Dodds.

Nos. 3 and 7 are dipping water-cisterns made by Mr. Dodds.

Nos. 4 and 6 are vases for gardens, designed by Mr. F. Inigo Thomas and made by Mr. Dodds.

No. 8 is a gilt copper vane designed by Mr. Troup; and No. 9 a tub designed by Mr. Thomas; both these latter are made by Mr. Dodds.

CEANNACROC, GLENMORISTON, INVERNESS-SHIRE.

THIS shooting lodge has been built on a fine site near the head of Glenmoriston for Mr. C. L. Orr-Ewing, M.P. The material used for the walling was local stone, quarried close to the site. A few red-stone dressings have been used, while the general surfaces of the walls have been rough cast. The roofs are covered with tiles. A very complete installation of electric light has been fitted; the driving power for the dynamo being a turbine. The works included besides the lodge proper, stabling, workmen's houses, kennels, laundry, &c., and water supply. The contractors were as follows:—Mason and joiner works, J. & G. Findlay, Glasgow; plumber work, W. Anderson, Glasgow; tile work, Woolliscroft & Sons, Hanley; rough cast work, J. C. Highet, Ayr; plaster work, Calder & Sons, Glasgow; electric lighting, Reid & Co., Ayr; painter work, B. Bennett & Sons, Ayr. Mr. Jas. Watson acted as clerk of works for the greater part of the time the contract lasted.

JAS. KENNEDY HUNTER.

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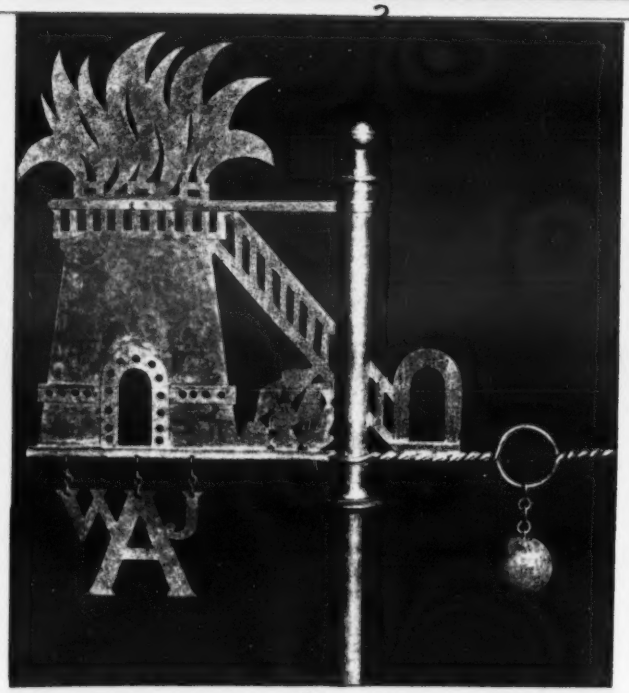

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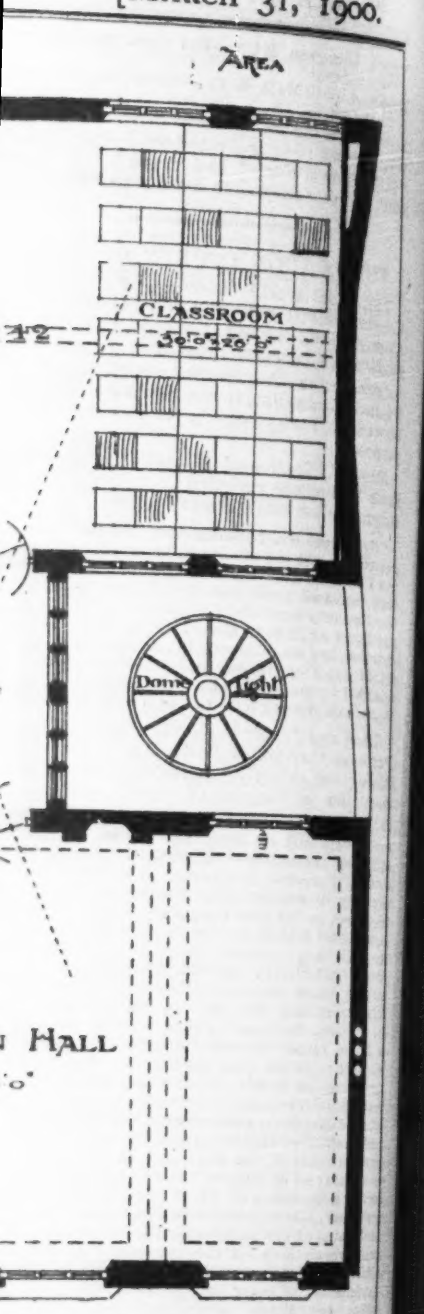
INK-PHOTO SPRAGUE & Cº L.TD 4 & 5 EAST HARDING STREET FETTER LANE E.C

SOME MODERN LEAD WORK.



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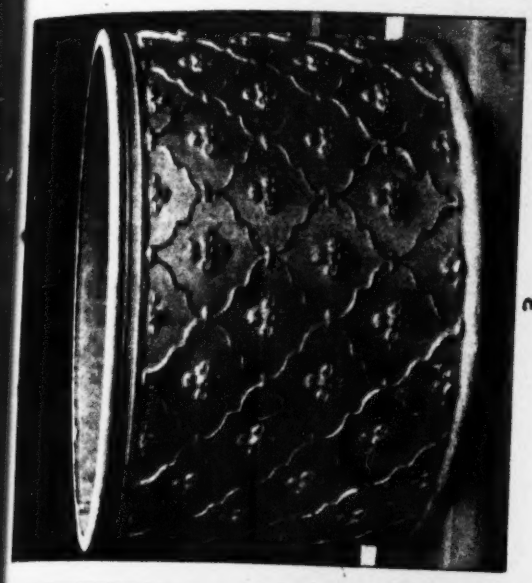

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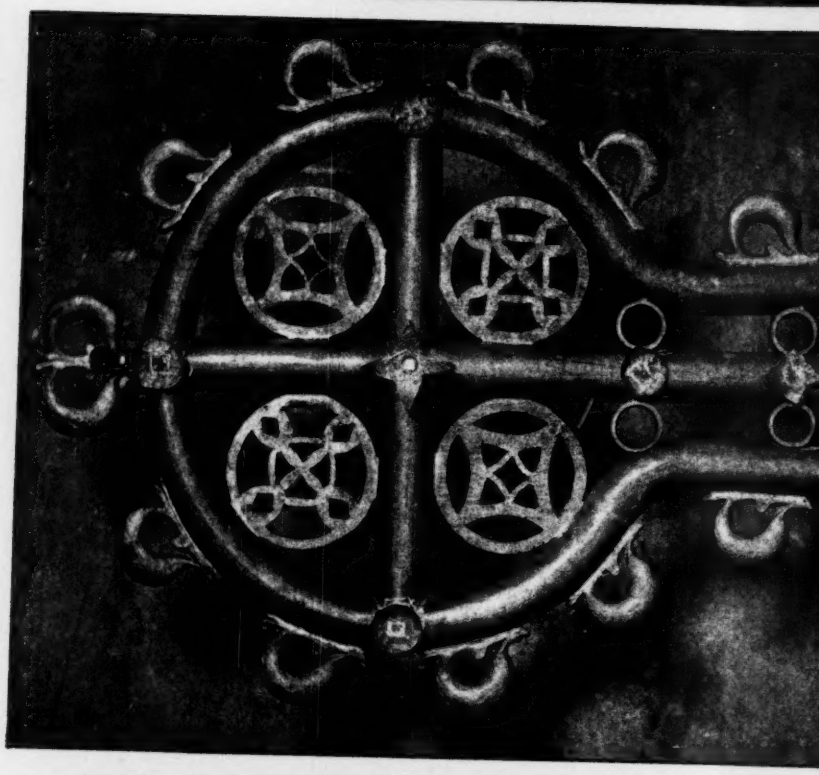

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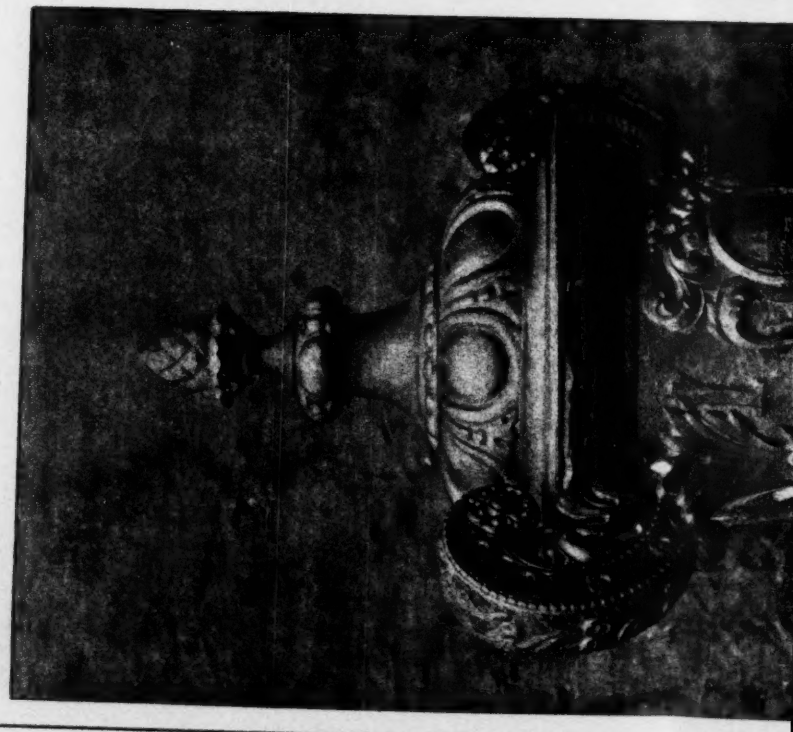

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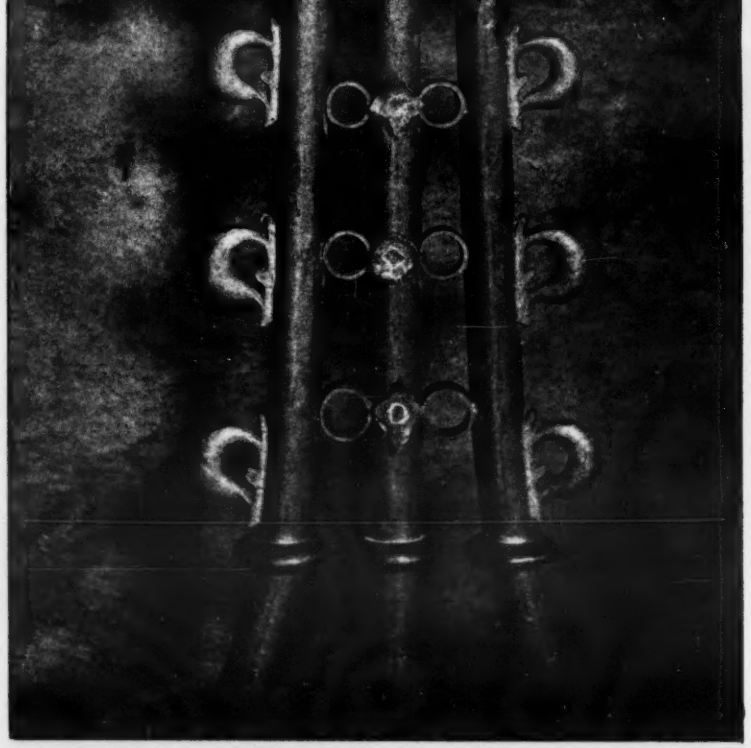

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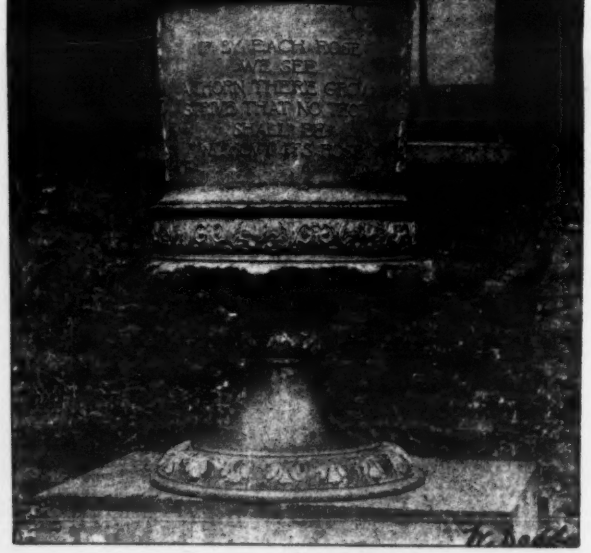

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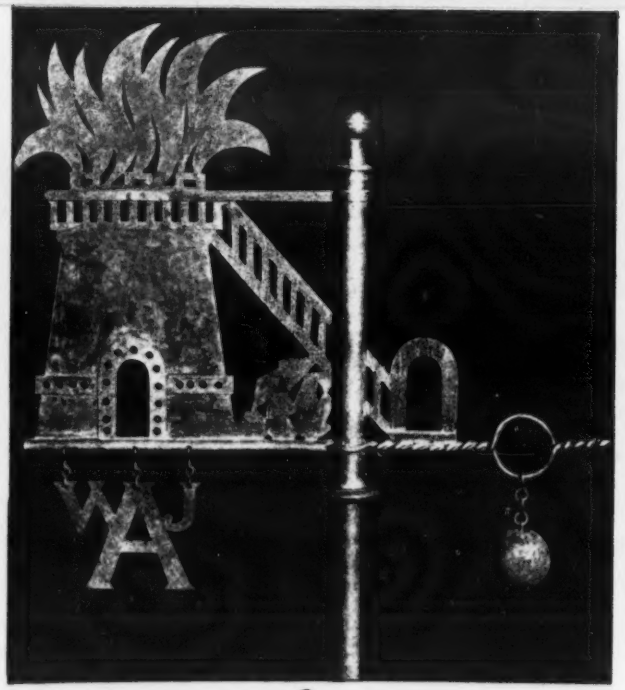

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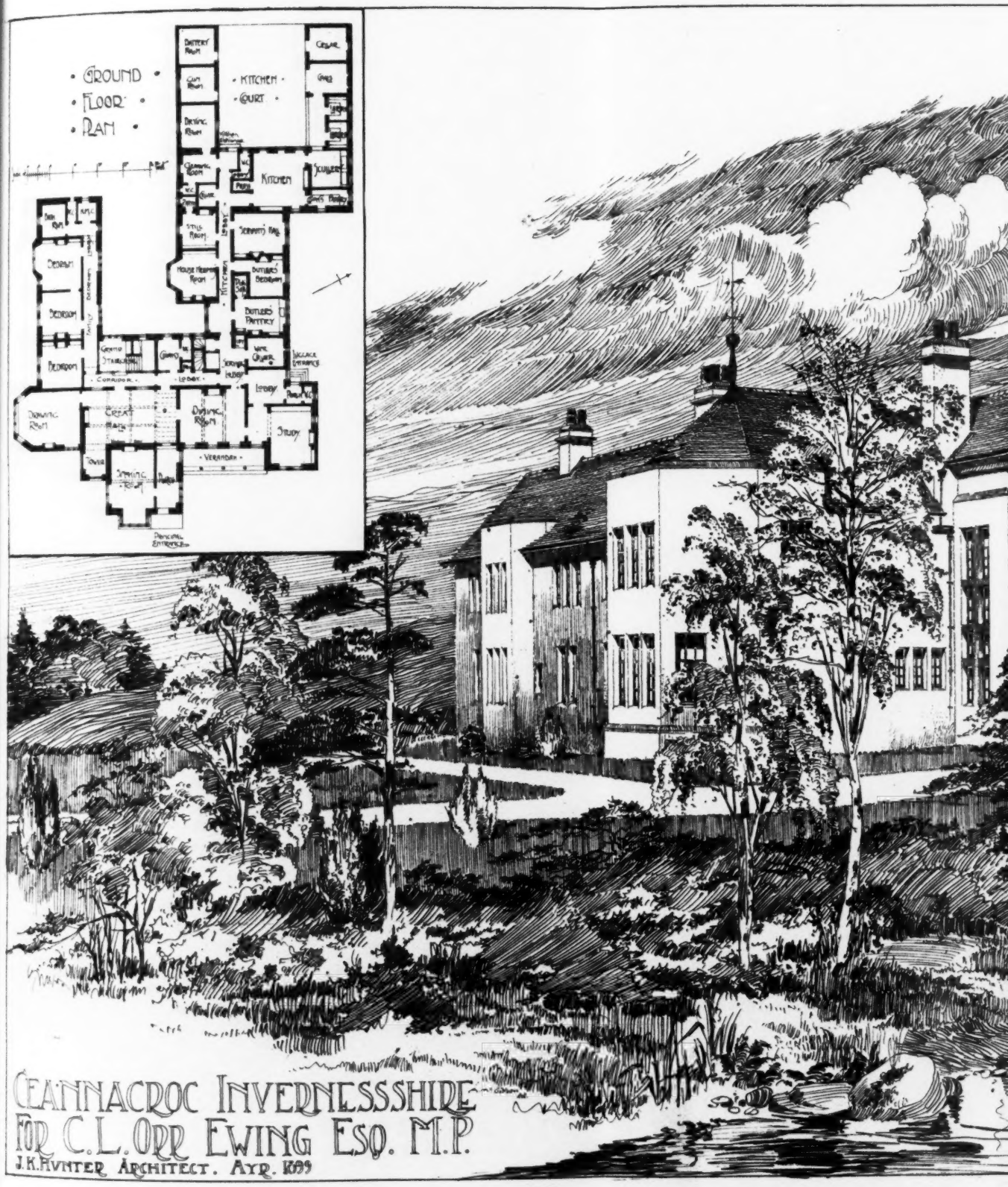
SOME MODERN LEAD WORK.



CEANNACROC INVERNESSSHIRE
FOR C.L. ORR EWING ESQ. M.P.
J.K. HUNTER ARCHITECT. AYR. 1899

PHOTO-LITHO. SPRAGUE & Co.ᴸᵀᴰ 94 & 5, EAST HARDING STREET, FETTER LANE, E.C.

HOUSES AT WINCHMORE HILL.

ALFRED H. HART, ARCHITECT.

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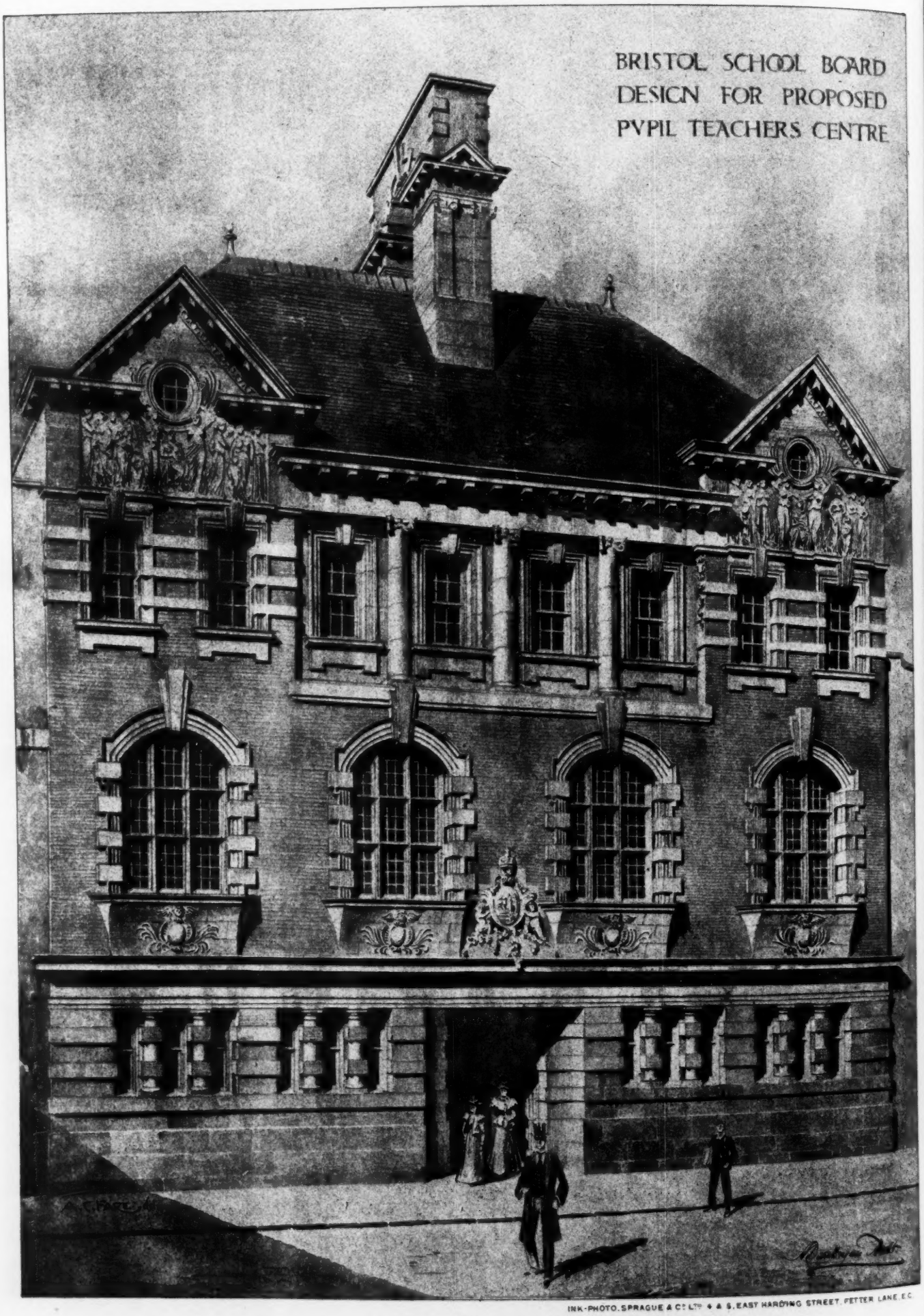

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INK-PHOTO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

NEW LONDON AND COUNTY BANK, CHICHESTER.—Messrs. Cheston & Perkin, Architects.

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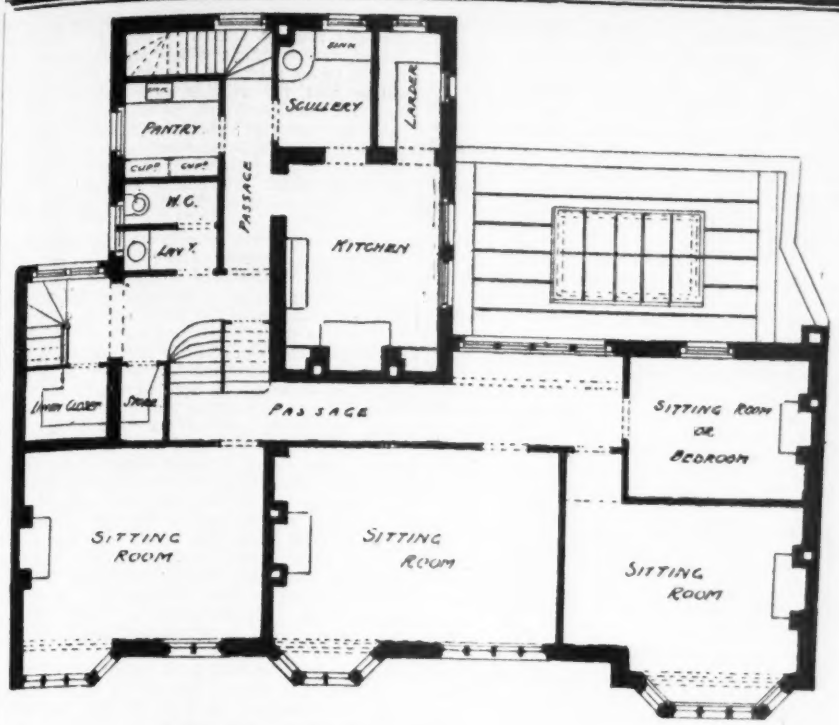
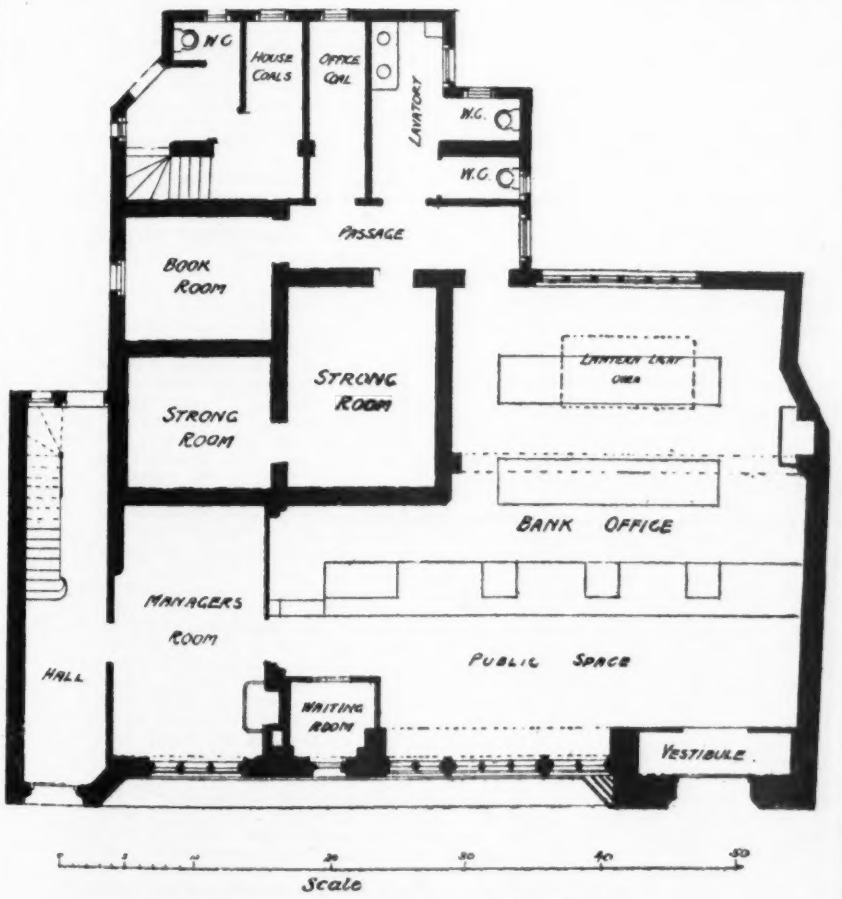
DESIGN FOR A COUNTRY HOUSE.—Mr A. E. Street, F.R.I.B.A., Architect





London and County Bank, Chichester. Plans.

DESIGN FOR PUPIL TEACHERS' CENTRE, BRISTOL.

THIS design was prepared for a site which formed part of the precincts of Bristol Castle, and which is so precipitous that the back portion of both the two lower floors is below ground.

The design is by Mr. H. Dare Bryan, architect, of Bristol, and was exhibited at the Royal Academy last year.

LONDON AND COUNTY BANK, CHICHESTER.

THE new premises of the London and County Banking Company, which have been recently erected at Chichester, have a frontage of 60 ft. to East-street, close to the Old Cross. The ground floor comprises a large banking hall, manager's room, strong room, &c., occupying an area 50 ft. by 34 ft. 6 in., well lighted by large windows back and front. Accommodation is provided for twelve clerks, but by a little re-arrangement of the fittings accommodation for five additional clerks can be provided when required. The counter is 40 ft. long, and gives accommodation for four cashiers' desks and a chief clerk's desk. The space in front for the public is 50 ft. long and 9 ft. wide, having a floor of marble mosaic paving, the flooring behind the counter being of pitch-pine blocks.

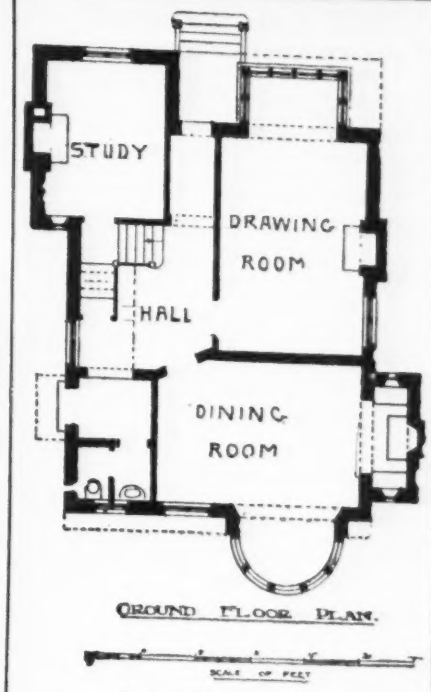
The whole of the internal fittings, screens, &c., are of oak wax polished, specially designed by the architects in character with the style of the building.

In the rear of the banking hall are three strong rooms, a clerks' luncheon room, and lavatories. The strong rooms are 15 ft. by 11 ft., 10 ft. by 10 ft., and 10 ft. by 9 ft. respectively, constructed throughout with fireproof materials with several strands of iron built in in each course of brickwork, rendering the walls as burglar-proof as possible, and faced internally with best quality white-glazed bricks, the strong room doors being made and supplied by Messrs. Chubb & Co.

The banking hall is warmed by means of hot water, the work being carried out by Mr. W. Stainton, of King's Cross.

Above the banking department is arranged a thirteen-roomed house on three floors for the bank manager, with kitchen, bath-room, and usual offices in addition.

The building is designed in a late period of Gothic, with oriel windows. The carving on the string courses, grotesques, &c., has been executed by Messrs. Farmer & Brindley in Ancaster stone from Messrs. Lindley's quarries. The walling is of squared rubble with all beds and joints chiselled. The whole of the gas and desk standards and fittings have been specially designed by the architects, and executed by Messrs. Hart, Son, Peard, & Co. The contract sum, including the fittings, was 7,521*l*. The general contract has been carried out by Mr. Arthur Burrell, of Arundel and Littlehampton, from the drawings, specification, and details, and under the personal supervision of the architects, Messrs. Cheston & Perkin, of London. Mr. E. H. Henley was clerk of the works.



House, Winchmore Hill.

HOUSES AT WINCHMORE HILL.

THESE houses were designed some three years ago when a small estate was being laid out. The plan shown is that of the nearest house in the illustration. In actual execution the half-timber work has been omitted, as it was found that oak, the only suitable material for the purpose, was too expensive.

Winchmore Hill is about ten miles from town, on the Great Northern Railway, and as it was necessary to design the houses to occupy only a limited frontage, an attempt has been made to vary them sufficiently to prevent the disastrous monotony occasionally felt in newly laid-out roads, and this precaution is especially necessary in a rural district.

ALFRED H. HART.

DESIGN FOR A COUNTRY HOUSE.

THIS house was designed for a site sloping slightly to the south-west and more rapidly to the south-east, and is planned with a terrace, walled except on the south-west. The materials are red facing bricks and Horsham stone, and Brackwell tiles.

Internally the hall, stairs, and landing are panelled in oak to the ceiling, and the drawing-room to a height of 4 ft. 6 in. The boudoir is a single-storied room, and is ceiled with a flat dome in the manner of the well-known example in the Soane Museum. A. E. STREET.

ARCHITECTURAL SOCIETIES.

YORK ARCHITECTURAL SOCIETY.—The members of the York Architectural Society held the concluding meeting of their winter session on Thursday evening last week, in the lecture-room at the Church Institute, Mr. W. G. Penty, F.R.I.B.A., in the chair. Mr. Charles Hadfield (Sheffield) in the course of a lecture entitled "The Architecture of the Fifteenth Century and Early Tudor Period," regretted that the great epoch of English architecture which had existed and developed in the preceding four hundred years should have been put an end to by the invading influence of the Renaissance. Mr. Hadfield laid great stress on the need for fidelity to national traditions in the study of architecture, and suggested that the style of the future would be most satisfactorily evolved by taking up the development of English architecture where it was cut short in the sixteenth century. He urged that, so far as English architecture was concerned, we were justified in saying that the advent of the Renaissance had marked the end of all true progress. The history of the last 300 years was the history of reaction. The leeturer's remarks were illustrated by limelight views.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association on Saturday last week visited St. Bridget's Church, Dalgety, and Donibristle House, under the leadership of Mr. Frank W. Simon, architect. The church is roofless and has been frequently altered, so that few of the Gothic features remain. A fine Renaissance addition at the west end consists chiefly of a room on the upper floor panelled in polished stone. The remains of Donibristle House are now a quaint ruin with two wings for offices, the latter still occupied. On the motion of Mr. James Bruce President, Lord Moray (by whose permission the visit was made) and Mr. Frank W. Simon were thanked.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On Wednesday afternoon, the 21st inst., between twenty and thirty members of the Association paid a visit to the Dolphins Barn Brick Works. The party was received by the directors, Messrs. Fox, Allen, Ward, and Doyle, who, with Mr. John Good, the managing director, and Mr. Milligan, works manager personally conducted the members over the extensive works, and explained the latest methods of making bricks by machinery, and the various operations the clay undergoes from the time it is dug until it becomes "hard, sound, well-burnt stock bricks." The works were erected in 1898, and only commenced operations last year. The bricks manufactured are those known in the building trade as stock bricks, and appear to be a well-burnt, solid brick of an extremely tough and durable nature. One object in starting this company was to try and check to some extent the importation of common bricks from Cardigan and elsewhere, and this object seems to have been attained. It may be remembered that the employees are all from the locality, and were trained on the works. Constant employment is thus assured to a large number of the inhabitants of this otherwise poor neighbourhood.

COMPETITIONS.

HARBOUR WORKS AT FINDOCHTY, BANFFSHIRE.—The Findochty Harbour Commissioners have accepted the design by Mr. D. J. Reid, C.E., Inverness, for new pier and deepening of fishing harbour at Findochty, on the Moray Firth, at a cost of about 3,000*l*. Competitive plans were received from engineers in Aberdeen, Inverness, and Oban. The new pier will enable the Commissioners to give 10 ft. depth at low water.

ABERDEEN ARCHITECTS' SOCIETY.—The second annual dinner of this body took place in the Grand Hotel, Aberdeen, on the 23rd inst., Mr. Arthur Clyne, President of the Society, occupied the chair, and Mr. Duncan McMillan, architect, acted as croupier. Mr. R. G. Wilson, architect, proposed "The Town Council," and Lord Provost Fleming replied. Mr. James Souttar, architect, gave "The Federated Building Trades," coupled with the name of Mr. John Morgan, master mason. The toast of "The Society of Architects" was proposed by Mr. John Fyfe, quarrymaster, Kemnay, and replied to by the Chairman. Bailie Lyon gave "The Architectural Profession," and Mr. W. Kelly replied. In several of the speeches reference was made to the Aberdeen Corporation Bill now in Parliament, and to the joiners' strike in the city.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the following applications under the London Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Projection.

Marylebone, West.†—An iron covered way at The Hermitage, No. 12, Abbey-road, St. John's Wood (Messrs. J. Mitchell & Co. for Mr. R. B. Bentley).—Refused.

Width of Way and Space at Rear.

Hammersmith.—Two blocks of flats on the north-west side of Queen-street, Hammersmith, on the site of Nos. 54, 54a, 56, 58, and 60, and with an irregular space at the rear (Mr. W. G. Ingram for Mr. C. W. Carpenter).—Consent.

Buildings for the Supply of Electricity.

Strand.—An extension to the generation station and works at the St. James and Pall Mall Electric Light Company, Limited, station, Carnaby-street, Regent-street, St. James's, to abut on Ganton-street and Marshall-street (Mr. C. S. Peach for the company).—Consent.

Separation of Buildings.

St. George, Hanover-square.—The removal of the existing staircases and partitions between the basement and first floor levels at No. 172, New Bond-street, St. George, Hanover-square, and the construction of oak staircases in substitution for those removed (Mr. W. F. Unsworth, for Messrs. Johnson, Walker, & Tolhurst, Limited).—Consent.

Southwark, West.—Formation, on the ground floor, of an opening in the party wall between Nos. 313 and 315, High-street, Borough, without making the buildings, when considered as one building, in conformity with the provisions of the said Act (Mr. G. A. Lansdown for Mrs. Lewis).—Refused.

Width of Way and Construction of Building.

Kensington, North.†—A temporary wood and iron shed in the garden at the rear of No. 28, Holland Park-avenue, Kensington, at less than the prescribed distance from the centre of Ladbroke-terrace-mews (Mr. J. C. Inglis).—Refused.

Recommendations marked † are contrary to the views of the Local Authorities.

ECCLESIASTICAL ARCHITECTURE OF SCOTLAND.

THE first of the course of Rhind Lectures in archæology was delivered in the hall of the National Portrait Gallery, Edinburgh, on the 20th ult., by Mr. Thomas Ross, architect, Edinburgh, whose subject was "The Ecclesiastical Architecture of Scotland from the Twelfth to the Sixteenth Century." During the eleventh century, he said, there was a great development of architecture in the south and west of Europe, which reached Scotland after the middle of the twelfth century by the arrival here of the Saxon Princess Margaret, her relations, and followers. After her marriage with Malcolm Canmore, she devoted herself greatly to church work, and in process of time her three sons, Edgar, Alexander, and David, became notable builders, the latter being the pre-eminent founder of abbeys and churches known in Scottish history, and whose fame in this respect was kept alive by the sarcastic remark of one of his successors on the throne. By their efforts the Celtic Church was gradually pushed into the background, and the Roman Church became the chief factor in Scottish life for the next 400 years. The remains of the architecture of the Celtic Church on the mainland were few—the principal being the three towers of Brechin, Abernethy, and Restennet, and they probably exercised a considerable influence on certain towers in the same locality built under the new influence. The number of churches and abbeys founded during the twelfth century was very great, and in the case of what might be called parish churches it was probable that the wants of the country were well supplied for a long time thereafter. There still remain indications of this in the Norman work to be found at about seventy or eighty places in Scotland; while of the places which had churches of that period, and of which no evidence now existed, the number was known to be considerable. It might be considered doubtful if we possessed the means of enumerating them. Many of these buildings, although of small size, were of great richness and merit, as might be seen at Tynningham, Dalmeny, Leuchars, St. Blane, Dunning, Muthill, Lamington, Stobo, Edinburgh Castle, and other places, where considerable remains still existed. At many of the places included in the foregoing estimate the indications were scanty, sometimes consisting of only a single stone containing some Norman detail; and on the other hand, such stately portions as were to be found at Jedburgh, Dryburgh, or Dunfermline, the last being the principal Norman church in Scotland. Margaret built a church there, which was continued and finished by her sons, and it might be considered as certain that the existing nave was the work of Alexander and David from the circumstance that its aisles were intended to be stone-vaulted, having ribs from the very commencement, such a method of construction being unknown till after the period of Margaret's death. The church founded by her probably formed the choir, to which the existing nave was attached.

The second of the lectures was delivered on the 28th ult. Consideration of the Norman Churches was resumed, principally those of the north and of the islands. These are, generally speaking, less elaborate than the churches of the south, except, perhaps, at Iona, where there is Norman work at the several buildings having considerable architectural display. It was shown that at various times the little island must have presented an epitome of what was going on, in the way of building operations, on the mainland. Although most of the work belongs to a later age, St. Oran's Chapel, with its enriched doorway, is entirely of Norman work. Some of the early churches in Orkney were described, especially the Church of Egilsay and its western round tower. It was contended that the church was a fairly typical example of the churches of the period under consideration. In this connexion reference was made to the remarkable church of Cockburnspath in East Lothian, with its western round tower, of which almost no notice has ever been taken. That it represented the site of a very early building there could be no doubt. Before describing the Norman work in the cathedrals and monasteries, a general description of the arrangement of our abbeys was given, founded on numerous ground plans, hung on the walls. As might be expected from the history of Scotland, no abbey buildings existed in anything like a perfect condition. Newbattle Abbey, although almost the whole walls had been cleared away, exhibited in its foundations, recently laid bare by the late Marquis of Lothian, as good an idea of the general extent and arrangement of such an establishment as was to be found anywhere else in Scotland. Great similarity was observed throughout the country in the arrangement and disposition of the buildings, and there did not appear to have been, as in other countries, plans peculiar to certain orders of monks. Although the general disposition of the buildings round the cloister was the same, there was the utmost variety in the individual buildings themselves, and in their architectural details, arising in part from the site, from the wealth of the abbey and its size, and from the periods when its different parts might have been built. Except in the case of five or six abbeys, the church occupied the whole of the north side of the cloister. The Chapter-house on the east side was always a building of great dignity, and what was singular was that its west end was practically left open without any enclosure whatever. In the southern range the refectory was the principal building. This, in the houses of certain orders abroad, always stood at right angles to the church, but every refectory in Scotland was parallel to the church, with the reader's pulpit in the south wall instead of the east wall. The eastern range was devoted to the lay brethren and the outdoor workers, with apartments for guests and travellers, this side not being generally well represented in Scotland. The dormitories were situated above the east and west ranges. More detailed descriptions were given of some of the border abbeys—Jedburgh, Kelso, Dryburgh, and the remarkable Church of Coldingham, with its superb gallery. The Cathedral Church of St. Magnus, although begun about 350 years before the islands were ceded to Scotland, might be regarded as a Scottish building, much work having been done at it since. Many of its parts showed fine examples of Norman art, and it finished with a characteristic feature of the style—an eastern apse—which in an extension of the cathedral was superseded by a square east end, as happened at Lindisfarne and Durham, and it was believed at Dunfermline and Coldingham. In Scotland there were only some ten such apses, so far as was known, all the other churches of that period being square ended.

The third lecture was delivered on the 2nd inst. There was no example of architecture remaining in Scotland which was anything like complete, our best-preserved buildings being little better than empty shells. It was only from the registers and inventories of the great abbeys and churches, and from the accounts of their destruction, that they gathered how rich they were in carved and painted woodwork and metal work, in books and vestments, while of the great palaces and castles of the abbots and bishops, which, in the case of Glasgow, Aberdeen, Melrose, and other places, appeared to have rivalled the churches in size and grandeur, almost nothing remained. The rise and rapid development of great monasteries throughout the country, at a time when towns hardly existed, was probably the wisest and most enlightened policy which could have been adopted. The planting of colonies of 200 or 300 men, all skilled in some kind of craft, was sure to exercise a most beneficent effect throughout the locality, and in the neighbourhood of many abbeys the results of this were visible to this day. The

greatest buildings of the kind ever, perhaps, created in Scotland were the Cathedral of St. Andrews, with the buildings of the Priory at the same. Begun at the time (1158) when the transition from Norman architecture to Gothic was taking place, it exhibited in its eastern and western gables (all between having mostly vanished), in a striking manner, which might be taken in at a glance, the great advance which was made in the designing and composition of a façade in the course of little more than a century. Prior Winton's descriptions of the building of the Cathedral were most valuable, and a fine testimony to their accuracy was borne by the respond of the south transept arcade. This arcade, he informed us, was burned in 1378, and the calcined pillars were renewed, the upper part of the wall being temporarily supported. This respond was quite in the style of the fourteenth century, and would not have been easily accounted for but for the Prior's descriptions. Special attention was called to the magnificent wall enclosing the whole buildings, as being the finest thing of the kind in Scotland. The Cathedrals of Elgin and Glasgow were next referred to. The former had undergone many alterations, having been enlarged from a three-aisled church, to one having five aisles in the nave. Adaptations and alterations repairing the loss of war and fire, and always with a beautiful result, were the record of Elgin. At Glasgow there was more continuity, and probably the original plan was the plan they saw to-day, and which in several most important respects (in its east end and in its lower church) differed from all our other Cathedrals. The abbeys of Holyrood and Arbroath were next taken up. The first, even in its very fragmentary state, presented a wide range of architectural periods. Its beautiful west front, with its refined and peculiar details and its magnificent doorway, exhibited quite a contrast to the west front of Arbroath, where, owing to the peculiar way in which it had fallen into ruin, and the singular trunk-like additions in front of the entrance, the west façade had a forlorn and rugged appearance. But it must have been a most commanding and impressive church, just such a building as befitted the name of William the Lion. Arbroath was fortunate in possessing the Abbot's House yet entire, and the great buildings used by the Abbot's Justiciar, Chamberlain, and Bailie. A brief reference was made to the Abbey of Balmerino, founded by the Queen Ermengard, widow of William. Its Chapter House, still fairly entire, was a building of much interest and great beauty.

The fourth lecture was delivered on the 5th inst. As showing how thickly the country was studded with religious houses, the district extending from Balmerino and Lindores westwards along the Tay, for little more than one day's march, was selected —to Cupar on the one hand, and to Inchaffray on the other. Within this compass there existed eleven such houses at least, with somewhere about nine lesser churches in Perth. Many of the former buildings were of great size and of considerable architectural splendour, but of only two, Balmerino and Lindores, could it be said that anything coherent remained. Two others were marked by some crumbling walls and a few moulded stones, and the remainder had entirely disappeared. Of the nine churches, only St. John's was left. This showed in a striking manner how fragmentary the materials were out of which the historian of the mediæval architecture of Scotland had to piece his subject together. The same story had to be told of whatever part of the country they might turn to. Along the Moray Firth and along the Forth and Clyde the ruins of what were stately churches were to be found in great numbers. The architectural features of several of the abbeys in these districts were referred to, and the lecturer said that at many of them doubtless much lay hidden beneath the soil and beneath the rubbish heaps which marked their sites which would be of great value to all students of Scottish history, if only it could be unearthed. It was pointed out that the Abbey of Inchcolm was the best preserved in Scotland, and that it was somewhat different in plan from all the others, inasmuch as three sides of the cloisters on the ground floor were entirely given up for an ambulatory. In other houses this space was divided into many apartments and devoted to various uses. This ambulatory was vaulted and rather dimly lighted, and was most impressive. The Abbeys of Culross and Cambuskenneth were next taken up, the first being peculiar in having a double church divided by a tower of solid walls rising from the ground. The eastern was probably the church of the monks and the western one that for the parishioners. Considerable remains of the abbey were in existence, the western range of buildings being better preserved than the same side usually was in Scotland. At Cambuskenneth the detached tower was the principal part left, and it appears to have been erected after the destruction of a former bell tower by lightning in the fourteenth century. It was simply a stronghold, and was probably used as such after the Reformation. The west doorway of the church, much wasted, and the foundations of the monastery still existed. Proceeding to consider some of the later phases of Gothic architecture in Scotland, it was shown that during the fourteenth century comparatively few churches were erected in Scotland, the masons finding occupation in the erection of massive, stubborn castles, and this had a most important effect on the ecclesiastical architecture which was to follow. Cut off, as it were by this circumstance from following the general trend of Gothic elsewhere, when church building was resumed, castellated forms of construction and decoration constantly appeared, and many of our churches, such as Queensferry and Yester, especially in the interior, had as much of a castellated as of an ecclesiastical appearance. Previous to this interruption Gothic architecture in Scotland followed very much the same lines as in England, but thenceforward there continued to be a style peculiar to Scotland, not always strictly Gothic in its construction, but always full of interest and quaint beauty. Yet it is curious to know that it was during this period that the most consistent church of Gothic construction ever built in Scotland was erected at Melrose, the Abbey of which was described at some length.

The fifth lecture was delivered on the 7th inst. Regarding Dunblane Cathedral, it might, the lecturer said, be observed that it was a building on which comparatively few alterations had been made by the ravages of war or fire, and being of one age it possessed a unity of style not often found in our large churches. The cathedral was very simple in plan, consisting of an aisleless choir and a nave, with north and south aisles of eight bays and a lady chapel on the north side of the choir separated by a wall. This was the oldest part (excepting the tower, which belonged to an earlier church), and was probably in use for service while the cathedral was building. The cathedral was remarkable in Scotland for the remains of its woodwork, its stalls being almost the most complete remnants of ecclesiastical furniture left. A rapid survey was taken of the other remains of this kind. Proceeding to deal with Rosslyn, the lecturer remarked that this church had been entirely misunderstood. Mr. Fergusson, in the "Handbook of Architecture," assured us that William Lord St. Clair did not employ his own countrymen in erecting this building, and that the whole credit was due to Spaniards, and that was now the general view of the subject. Some writers did not agree with that, notably the late Sir Gilbert Scott, who, in his "History of English Church Architecture," asserted that it was a work of Scottish architecture. It was shown to be on plan identical with the east end of Glasgow Cathedral, and two or three other points of resemblance between the two buildings were referred to and illustrated. Taking up the details of Rosslyn with considerable minuteness, it was shown that almost every individual detail could be referred back to some Scottish church or castle. The excessive richness of the building, especially at the east end, with its fretted work and pendant carvings, had easily inclined most critics to the belief in its Spanish origin, but it was in reality a Scottish church in the manner of the fifteenth century. It was this period, coinciding in a general way with the reign of the Stuart kings, which formed what might be called the strictly Scottish period, when through the interfusion of ideas from the castles the ecclesiastical architecture of Scotland assumed a national aspect. This was found most conspicuously in the Collegiate Churches, of which there were about forty in number, erected during that period, and also in many parish churches. The founding of large monasteries had now almost ceased, and the Collegiate Churches were taking their place and doing the work which they were unable or were neglecting to do. They were formed by the grouping together of a certain number of generally remote parish churches, chaplainries, and hospitals, and were erected in towns or central districts. The members of a college, presided over by a provost, seldom exceeded ten or twelve, resided in manses, and they were responsible for the maintenance of the religious service of their locality. These churches were generally of small size as compared with the cathedrals and abbeys, and the favourite plan was a cross church without aisles, with a low central or western tower, of which fine examples exist at Dunglass, Crichton, Seton, Whitekirk, St. Monans, Tullibardine, Biggar, Corstorphine, Dysart, and other places. The tower of the last mentioned, which might easily be mistaken for a Peel tower, showed how close was the relation between the castellated and ecclesiastical architecture of the country at that period. There was not much variety in the designs of Scottish towers. They generally depended for their effect on their massive masonry, and exhibited few architectural details, the principal exceptions being perhaps the central tower of Haddington and the western towers at Stirling and Dundee. The latter was by far the most dignified erection of the kind in Scotland. Apsidal ends became frequent at this period, but they differed from those of Norman times in never being circular on plan, but always being composed of part of a polygon, and this doubtless for the ease with which large traceried windows could be erected in them, as was observable at Linlithgow and Stirling. The apse of the latter was a most stately and dignified termination to the church, and remarkable for the determined effort made to vault it with a tunnel vault like a castle, a method which would hardly have been attempted in a rounded building anywhere but in Scotland.

The sixth and last of the lectures was delivered on the 9th inst. Several of the larger churches of the later periods were, in the course of the lecture, passed under review. The churches of Stirling and Linlithgow had, Mr. Ross said, much in common, both having a western tower, and an eastern apse. The details of Linlithgow were the richer and better preserved of the two, but its apse lacked the interest of vaulting and the commanding height of the Stirling apse, which made it one of the most imposing eastern terminations in Scotland. The south side of Linlithgow, as seen against the grey walls of the Palace, was most beautiful, and its details were full of interest, especially the porch, with its niches and exquisite oriel window, which gave light to a small room over the groined entrance. There was a considerable resemblance in plan between the Church of St. John at Perth and the church at Haddington, and both were of about the same dimensions, of some 200 ft. by 60 ft., and were each dignified by a central tower. At Perth the crossing beneath the tower was entire, and although greatly degraded in its present condition, it had fine details of great breadth and simplicity. Haddington had been one of the finest parish churches in the country, and its east end and transepts, although now roofless, were constructed in the strictly Gothic manner, with details of the later manner of Scotland. Dunkeld and Paisley were two other churches having many points of resemblance; both had naves with aisles of considerable importance, with long, narrow, aisleless choirs. Both exhibited work of the thirteenth century, but as they now stood they were mainly of the fifteenth. The triforium of Paisley was fantastic, and in both this feature was extremely rude. The corbelled passage over this at Paisley was unique in Scotland, and was composed of castellated details. The curious unsymmetrical west end of Dunkeld was shown to be the result of an alteration made after the building had been erected, and the west front of Paisley showed work extending over a period of two hundred years. Aberdeen Cathedral was a building entirely of the fifteenth century, unless it might be a small part at the east end of the nave, which was begun in freestone, out of which they got more refinement of detail than from the hard granite of which most of the church was built. Aberdeen was not to be judged from small details, but from its imposing bulk, and from the massiveness of its towers and spires. The west gable, with its seven lofty windows, recalled the five sisters in the north transept of York. Both had the same effect of great height with absolute simplicity, and of finishing in a horizontal line. St. Giles, Edinburgh, afforded one of the best examples of the great alterations to which churches were often subjected in the Middle Ages, and how from a low and comparatively small church it grew, by additions on the one hand and now on the other, and again by the heightening of its whole roof, to be a many-aisled and widespread church, almost the whole vast area of which appeared at some period or other to have been vaulted in stone—a mode of finishing so often shirked in most of our large churches. It was shown that the architecture of St. Giles was carried out with details and parts somewhat after the style of Melrose and Linlithgow, and but for the clean sweep made of all these, it would have ranked in interest and beauty, as it did in size, as almost the principal church built in the Scottish manner. In the course of these lectures the question must sometimes have occurred—What was the meaning of all this abbey building going on for centuries? They might be sure that the successive kings and statesmen had other motives than to express their delight in architecture. Every abbey they founded was as a camp for Christian soldiers sent out on behalf of the purposes of civilisation—sometimes into the midst of heathendom, and always into the midst of oppression; and with such surroundings the effect must have been, and was, most salutary—that of a great abbey, with its well-ordered and beautiful buildings, its cultivated lands, and many activities.—*The Scotsman.*

BOOKS RECEIVED.

TRAVERSE TABLES, FOR USE IN MINE SURVEYING. By William Lintern. (Crosby Lockwood & Son.)

CONSUMERS' HANDBOOK OF THE LAW RELATING TO GAS, WATER, AND ELECTRIC LIGHTING. By Laurence Duckworth, Barrister-at-law. (Effingham Wilson.)

THE STEAM LAUNDRY. By John Taylor. (Heywood & Co.)

SURREY'S CAPITAL: A GUIDE TO GUILDFORD. By Joseph E. Morris. (The St. Bride's Press).

RESTORATION OF A SCOTTISH POET'S MONUMENT.—Subscriptions are being collected for the restoration of the monument in the Old Churchyard of Longside (Aberdeenshire), to the memory of the Rev. John Skinner, author of "Tullochgorum" and other Scotch songs and poems. The monument, which was erected in 1807, has become dilapidated, and on the recommendation of Mr. Arthur Clyne, architect, Aberdeen, it is proposed to take it down to the foundation, rebuild it, and insert a new panel of Sicilian marble of a more durable nature than the former one, but with a corresponding inscription.

ARCHITECTURAL SOCIETIES.

YORK ARCHITECTURAL SOCIETY.—The members of the York Architectural Society held the concluding meeting of their winter session on Thursday evening last week, in the lecture-room at the Church Institute, Mr. W. G. Penty, F.R.I.B.A., in the chair. Mr. Charles Hadfield (Sheffield) in the course of a lecture entitled "The Architecture of the Fifteenth Century and Early Tudor Period," regretted that the great epoch of English architecture which had existed and developed in the preceding four hundred years should have been put an end to by the invading influence of the Renaissance. Mr. Hadfield laid great stress on the need for fidelity to national traditions in the study of architecture, and suggested that the style of the future would be most satisfactorily evolved by taking up the development of English architecture where it was cut short in the sixteenth century. He urged that, so far as English architecture was concerned, we were justified in saying that the advent of the Renaissance had marked the end of all true progress. The history of the last 300 years was the history of reaction. The lecturer's remarks were illustrated by limelight views.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association on Saturday last week visited St. Bridget's Church, Dalgety, and Donibristle House, under the leadership of Mr. Frank W. Simon, architect. The church is roofless and has been frequently altered, so that few of the Gothic features remain. A fine Renaissance addition at the west end consists chiefly of a room on the upper floor panelled in polished stone. The remains of Donibristle House are now a quaint ruin with two wings for offices, the latter still occupied. On the motion of Mr. James Bruce President, Lord Moray (by whose permission the visit was made) and Mr. Frank W. Simon were thanked.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On Wednesday afternoon, the 21st inst., between twenty and thirty members of the Association paid a visit to the Dolphins Barn Brick Works. The party was received by the directors, Messrs. Fox, Allen, Ward, and Doyle, who, with Mr. John Good, the managing director, and Mr. Milligan, works manager personally conducted the members over the extensive works, and explained the latest methods of making bricks by machinery, and the various operations the clay undergoes from the time it is dug until it becomes "hard, sound, well-burnt stock bricks." The works were erected in 1898, and only commenced operations last year. The bricks manufactured are those known in the building trade as stock bricks, and appear to be a well-burnt, solid brick of an extremely tough and durable nature. One object in starting this company was to try and check to some extent the importation of common bricks from Cardigan and elsewhere, and this object seems to have been attained. It may be remembered that the employees are all from the locality, and were trained on the works. Constant employment is thus assured to a large number of the inhabitants of this otherwise poor neighbourhood.

COMPETITIONS.

HARBOUR WORKS AT FINDOCHTY, BANFFSHIRE.—The Findochty Harbour Commissioners have accepted the design by Mr. D. J. Reid, C.E., Inverness, for new pier and deepening of fishing harbour at Findochty, on the Moray Firth, at a cost of about 3,000*l*. Competitive plans were received from engineers in Aberdeen, Inverness, and Oban. The new pier will enable the Commissioners to give 10 ft. depth at low water.

ABERDEEN ARCHITECTS' SOCIETY.—The second annual dinner of this body took place in the Grand Hotel, Aberdeen, on the 23rd inst., Mr. Arthur Clyne, President of the Society, occupied the chair, and Mr. Duncan McMillan, architect, acted as croupier. Mr. R. G. Wilson, architect, proposed "The Town Council," and Lord Provost Fleming replied. Mr. James Souttar, architect, gave "The Federated Building Trades," coupled with the name of Mr. John Morgan, master mason. The toast of "The Society of Architects" was proposed by Mr. John Fyfe, quarrymaster, Kemnay, and replied to by the Chairman. Bailie Lyon gave "The Architectural Profession," and Mr. W. Kelly replied. In several of the speeches reference was made to the Aberdeen Corporation Bill now in Parliament, and to the joiners' strike in the city.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the following applications under the London Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Projection.

Marylebone, West.†—An iron covered way at The Hermitage, No. 12, Abbey-road, St. John's Wood (Messrs. J. Mitchell & Co. for Mr. R. B. Bentley).—Refused.

Width of Way and Space at Rear.

Hammersmith.—Two blocks of flats on the north-west side of Queen-street, Hammersmith, on the site of Nos. 54, 54a, 56, 58, and 60, and with an irregular space at the rear (Mr. W. G. Ingram for Mr. C. W. Carpenter).—Consent.

Buildings for the Supply of Electricity.

Strand.—An extension to the generation station and works at the St. James and Pall Mall Electric Light Company, Limited, station, Carnaby-street, Regent-street, St. James's, to abut on Ganton-street and Marshall-street (Mr. C. S. Peach for the company).—Consent.

Separation of Buildings.

St. George, Hanover-square.—The removal of the existing staircases and partitions between the basement and first floor levels at No. 172, New Bond-street, St. George, Hanover-square, and the construction of oak staircases in substitution for those removed (Mr. W. F. Unsworth, for Messrs. Johnson, Walker, & Tolhurst, Limited).—Consent.

Southwark, West.—Formation, on the ground floor, of an opening in the party wall between Nos. 313 and 315, High-street, Borough, without making the buildings, when considered as one building, in conformity with the provisions of the said Act (Mr. G. A. Lansdown for Mrs. Lewis).—Refused.

Width of Way and Construction of Building.

Kensington, North.†—A temporary wood and iron shed in the garden at the rear of No. 28, Holland Park-avenue, Kensington, at less than the prescribed distance from the centre of Ladbroke-terrace-mews (Mr. J. C. Inglis).—Refused.

Recommendations marked † are contrary to the views of the Local Authorities.

ECCLESIASTICAL ARCHITECTURE OF SCOTLAND.

THE first of the course of Rhind Lectures in archæology was delivered in the hall of the National Portrait Gallery, Edinburgh, on the 26th ult., by Mr. Thomas Ross, architect, Edinburgh, whose subject was "The Ecclesiastical Architecture of Scotland from the Twelfth to the Sixteenth Century." During the eleventh century, he said, there was a great development of architecture in the south and west of Europe, which reached Scotland after the middle of the twelfth century by the arrival here of the Saxon Princess Margaret, her relations, and followers. After her marriage with Malcolm Canmore, she devoted herself greatly to church work, and in process of time her three sons, Edgar, Alexander, and David, became notable builders, the latter being the pre-eminent founder of abbeys and churches known in Scottish history, and whose fame in this respect was kept alive by the sarcastic remark of one of his successors on the throne. By their efforts the Celtic Church was gradually pushed into the background, and the Roman Church became the chief factor in Scottish life for the next 400 years. The remains of the architecture of the Celtic Church on the mainland were few—the principal being the three towers of Brechin, Abernethy, and Restennet, and they probably exercised a considerable influence on certain towers in the same locality built under the new influence. The number of churches and abbeys founded during the twelfth century was very great, and in the case of what might be called parish churches it was probable that the wants of the country were well supplied for a long time thereafter. There still remain indications of this in the Norman work to be found at about seventy or eighty places in Scotland; while of the places which had churches of that period, and of which no evidence now existed, the number was known to be considerable. It might be considered doubtful if we possessed the means of enumerating them. Many of these buildings, although of small size, were of great richness and merit, as might be seen at Tynningham, Dalmeny, Leuchars, St. Blane, Dunning, Muthill, Lamington, Stobo, Edinburgh Castle, and other places, where considerable remains still existed. At many of the places included in the foregoing estimate the indications were scanty, sometimes consisting of only a single stone containing some Norman detail; and on the other hand, such stately portions as were to be found at Jedburgh, Dryburgh, or Dunfermline, the last being the principal Norman church in Scotland. Margaret built a church there, which was continued and finished by her sons, and it might be considered as certain that the existing nave was the work of Alexander and David from the circumstance that its aisles were intended to be stone-vaulted, having ribs from the very commencement, such a method of construction being unknown till after the period of Margaret's death. The church founded by her probably formed the choir, to which the existing nave was attached.

The second of the lectures was delivered on the 28th ult. Consideration of the Norman Churches was resumed, principally those of the north and of the islands. These are, generally speaking, less elaborate than the churches of the south, except, perhaps, at Iona, where there is Norman work at the several buildings having considerable architectural display. It was shown that at various times the little island must have presented an epitome of what was going on, in the way of building operations, on the mainland. Although most of the work belongs to a later age, St. Oran's Chapel, with its enriched doorway, is entirely of Norman work. Some of the early churches in Orkney were described, especially the Church of Egilsay and its western round tower. It was contended that the church was a fairly typical example of the churches of the period under consideration. In this connexion reference was made to the remarkable church of Cockburnspath in East Lothian, with its western round tower, of which almost no notice has ever been taken. That it represented the site of a very early building there could be no doubt. Before describing the Norman work in the cathedrals and monasteries, a general description of the arrangement of our abbeys was given, founded on numerous ground plans, hung on the walls. As might be expected from the history of Scotland, no abbey buildings existed in anything like a perfect condition. Newbattle Abbey, although almost the whole walls had been cleared away, exhibited in its foundations, recently laid bare by the late Marquis of Lothian, as good an idea of the general extent and arrangement of such an establishment as was to be found anywhere else in Scotland. Great similarity was observed throughout the country in the arrangement and disposition of the buildings, and there did not appear to have been, as in other countries, plans peculiar to certain orders of monks. Although the general disposition of the buildings round the cloister was the same, there was the utmost variety in the individual buildings themselves, and in their architectural details, arising in part from the site, from the wealth of the abbey and its size, and from the periods when its different parts might have been built. Except in the case of five or six abbeys, the church occupied the whole of the north side of the cloister. The Chapter-house on the east side was always a building of great dignity, and what was singular was that its west end was practically left open without any enclosure whatever. In the southern range the refectory was the principal building. This, in the houses of certain orders abroad, always stood at right angles to the church, but every refectory in Scotland was parallel to the church, with the reader's pulpit in the south wall instead of the east wall. The eastern range was devoted to the lay brethren and the outdoor workers, with apartments for guests and travellers, this side not being generally well represented in Scotland. The dormitories were situated above the east and west ranges. More detailed descriptions were given of some of the border abbeys—Jedburgh, Kelso, Dryburgh, and the remarkable Church of Coldingham, with its superb gallery. The Cathedral Church of St. Magnus, although begun about 350 years before the islands were ceded to Scotland, might be regarded as a Scottish building, much work having been done at it since. Many of its parts showed fine examples of Norman art, and it finished with a characteristic feature of the style—an eastern apse—which in an extension of the cathedral was superseded by a square east end, as happened at Lindisfarne and Durham, and it was believed at Dunfermline and Coldingham. In Scotland there were only some ten such apses, so far as was known, all the other churches of that period being square ended.

The third lecture was delivered on the 2nd inst. There was no example of architecture remaining in Scotland which was anything like complete, our best-preserved buildings being little better than empty shells. It was only from the registers and inventories of the great abbeys and churches, and from the accounts of their destruction, that they gathered how rich they were in carved and painted woodwork and metal work, in books and vestments, while of the great palaces and castles of the abbots and bishops, which, in the case of Glasgow, Aberdeen, Melrose, and other places, appeared to have rivalled the churches in size and grandeur, almost nothing remained. The rise and rapid development of great monasteries throughout the country, at a time when towns hardly existed, was probably the wisest and most enlightened policy which could have been adopted. The planting of colonies of 200 or 300 men, all skilled in some kind of craft, was sure to exercise a most beneficent effect throughout the locality, and in the neighbourhood of many abbeys the results of this were visible to this day. The

greatest buildings of the kind ever, perhaps, created in Scotland were the Cathedral of St. Andrews, with the buildings of the Priory at the same. Begun at the time (1158) when the transition from Norman architecture to Gothic was taking place, it exhibited in its eastern and western gables (all between having mostly vanished), in a striking manner, which might be taken in at a glance, the great advance which was made in the designing and composition of a façade in the course of little more than a century Prior Winton's descriptions of the building of the Cathedral were most valuable, and a fine testimony to their accuracy was borne by the respond of the south transept arcade. This arcade, he informed us, was burned in 1378, and the calcined pillars were renewed, the upper part of the wall being temporarily supported. This respond was quite in the style of the fourteenth century, and would not have been easily accounted for but for the Prior's descriptions. Special attention was called to the magnificent wall enclosing the whole buildings, as being the finest thing of the kind in Scotland. The Cathedrals of Elgin and Glasgow were next referred to. The former had undergone many alterations, having been enlarged from a three-aisled church, to one having five aisles in the nave. Adaptations and alterations repairing the loss of war and fire, and always with a beautiful result, were the record of Elgin. At Glasgow there was more continuity, and probably the original plan was the plan they saw to-day, and which in several most important respects (in its east end and in its lower church) differed from all our other Cathedrals. The abbeys of Holyrood and Arbroath were next taken up. The first, even in its very fragmentary state, presented a wide range of architectural periods. Its beautiful west front, with its refined and peculiar details and its magnificent doorway, exhibited quite a contrast to the west front of Arbroath, where, owing to the peculiar way in which it had fallen into ruin, and the singular trunk-like additions in front of the entrance, the west façade had a forlorn and rugged appearance. But it must have been a most commanding and impressive church, just such a building as befitted the name of William the Lion. Arbroath was fortunate in possessing the Abbot's House yet entire, and the great buildings used by the Abbot's Justiciar, Chamberlain, and Bailie. A brief reference was made to the Abbey of Balmerino, founded by the Queen Ermengard, widow of William. Its Chapter House, still fairly entire, was a building of much interest and great beauty.

The fourth lecture was delivered on the 5th inst. As showing how thickly the country was studded with religious houses, the district extending from Balmerino and Lindores westwards along the Tay, for little more than one day's march, was selected —to Cupar on the one hand, and to Inchaffray on the other. Within this compass there existed eleven such houses at least, with somewhere about nine lesser churches in Perth. Many of the former buildings were of great size and of considerable architectural splendour, but of only two, Balmerino and Lindores, could it be said that anything coherent remained. Two others were marked by some crumbling walls and a few moulded stones, and the remainder had entirely disappeared. Of the nine churches, only St. John's was left. This showed in a striking manner how fragmentary the materials were out of which the historian of the mediæval architecture of Scotland had to piece his subject together. The same story had to be told of whatever part of the country they might turn to. Along the Moray Firth and along the Forth and Clyde the ruins of what were stately churches were to be found in great numbers. The architectural features of several of the abbeys in these districts were referred to, and the lecturer said that at many of them doubtless much lay hidden beneath the soil and beneath the rubbish heaps which marked their sites which would be of great value to all students of Scottish history, if only it could be unearthed. It was pointed out that the Abbey of Inchcolm was the best preserved in Scotland, and that it was somewhat different in plan from all the others, inasmuch as three sides of the cloisters on the ground floor were entirely given up for an ambulatory. In other houses this space was divided into many apartments and devoted to various uses. This ambulatory was vaulted and rather dimly lighted, and was most impressive. The Abbeys of Culross and Cambuskenneth were next taken up, the first being peculiar in having a double church divided by a tower of solid walls rising from the ground. The eastern was probably the church of the monks and the western one that for the parishioners. Considerable remains of the abbey were in existence, the western range of buildings being better preserved than the same side usually was in Scotland. At Cambuskenneth the detached tower was the principal part left, and it appears to have been erected after the destruction of a former bell tower by lightning in the fourteenth century. It was simply a stronghold, and was probably used as such after the Reformation. The west doorway of the church, much wasted, and the foundations of the monastery still existed. Proceeding to consider some of the later phases of Gothic architecture in Scotland, it was shown that during the fourteenth century comparatively few churches were erected in Scotland, the masons finding occupation in the erection of massive, stubborn castles, and this had a most important effect on the ecclesiastical architecture which was to follow. Cut off, as it were by this circumstance from following the general trend of Gothic elsewhere, when church building was resumed, castellated forms of construction and decoration constantly appeared, and many of our churches, such as Queensferry and Yester, especially in the interior, had as much of a castellated as of an ecclesiastical appearance. Previous to this interruption Gothic architecture in Scotland followed very much the same lines as in England, but thenceforward there continued to be a style peculiar to Scotland, not always strictly Gothic in its construction, but always full of interest and quaint beauty. Yet it is curious to know that it was during this period that the most consistent church of Gothic construction ever built in Scotland was erected at Melrose, the Abbey of which was described at some length.

The fifth lecture was delivered on the 7th inst. Regarding Dunblane Cathedral, it might, the lecturer said, be observed that it was a building on which comparatively few alterations had been made by the ravages of war or fire, and being of one age it possessed a unity of style not often found in our large churches. The cathedral was very simple in plan, consisting of an aisleless choir and a nave, with north and south aisles of eight bays and a lady chapel on the north side of the choir separated by a wall. This was the oldest part (excepting the tower, which belonged to an earlier church), and was probably in use for service while the cathedral was building. The cathedral was remarkable in Scotland for the remains of its woodwork, its stalls being almost the most complete remnants of ecclesiastical furniture left. A rapid survey was taken of the other remains of this kind. Proceeding to deal with Rosslyn, the lecturer remarked that this church had been entirely misunderstood. Mr. Fergusson, in the "Handbook of Architecture," assured us that William Lord St. Clair did not employ his own countrymen in erecting this building, and that the whole credit was due to Spaniards, and that was now the general view of the subject. Some writers did not agree with that, notably the late Sir Gilbert Scott, who, in his "History of English Church Architecture," asserted that it was a work of Scottish architecture. It was shown to be on plan identical with the east end of Glasgow Cathedral, and two or three other points of resemblance between the two buildings were referred to and illustrated. Taking up the details of Rosslyn with considerable minuteness, it was shown that almost every individual detail could be referred back to some Scottish church or castle. The excessive richness of the building, especially at the east end, with its fretted work and pendant carvings, had easily inclined most critics to the belief in its Spanish origin, but it was in reality a Scottish church in the manner of the fifteenth century. It was this period, coinciding in a general way with the reign of the Stuart kings, which formed what might be called the strictly Scottish period, when through the interfusion of ideas from the castles the ecclesiastical architecture of Scotland assumed a national aspect. This was found most conspicuously in the Collegiate Churches, of which there were about forty in number, erected during that period, and also in many parish churches. The founding of large monasteries had now almost ceased, and the Collegiate Churches were taking their place and doing the work which they were unable or were neglecting to do. They were formed by the grouping together of a certain number of generally remote parish churches, chaplainries, and hospitals, and were erected in towns or central districts. The members of a college, presided over by a provost, seldom exceeded ten or twelve, resided in manses, and they were responsible for the maintenance of the religious service of their locality. These churches were generally of small size as compared with the cathedrals and abbeys, and the favourite plan was a cross church without aisles, with a low central or western tower, of which fine examples exist at Dunglass, Crichton, Seton, Whitekirk, St. Monans, Tullibardine, Biggar, Corstorphine, Dysart, and other places. The tower of the last mentioned, which might easily be mistaken for a Peel tower, showed how close was the relation between the castellated and ecclesiastical architecture of the country at that period. There was not much variety in the designs of Scottish towers. They generally depended for their effect on their massive masonry, and exhibited few architectural details, the principal exceptions being perhaps the central tower of Haddington and the western towers at Stirling and Dundee. The latter was by far the most dignified erection of the kind in Scotland. Apsidal ends became frequent at this period, but they differed from those of Norman times in never being circular on plan, but always being composed of part of a polygon, and this doubtless for the ease with which large traceried windows could be erected in them, as was observable at Linlithgow and Stirling. The apse of the latter was a most stately and dignified termination to the church, and remarkable for the determined effort made to vault it with a tunnel vault like a castle, a method which would hardly have been attempted in a rounded building anywhere but in Scotland.

The sixth and last of the lectures was delivered on the 9th inst. Several of the larger churches of the later periods were, in the course of the lecture, passed under review. The churches of Stirling and Linlithgow had, Mr. Ross said, much in common, both having a western tower, and an eastern apse. The details of Linlithgow were the richer and better preserved of the two, but its apse lacked the interest of vaulting and the commanding height of the Stirling apse, which made it one of the most imposing eastern terminations in Scotland. The south side of Linlithgow, as seen against the grey walls of the Palace, was most beautiful, and its details were full of interest, especially the porch, with its niches and exquisite oriel window, which gave light to a small room over the groined entrance. There was a considerable resemblance in plan between the Church of St. John at Perth and the church at Haddington, and both were of about the same dimensions, of some 200 ft. by 60 ft., and were each dignified by a central tower. At Perth the crossing beneath the tower was entire, and although greatly degraded in its present condition, it had fine details of great breadth and simplicity. Haddington had been one of the finest parish churches in the country, and its east end and transepts, although now roofless, were constructed in the strictly Gothic manner, with details of the later manner of Scotland. Dunkeld and Paisley were two other churches having many points of resemblance; both had naves with aisles of considerable importance, with long, narrow, aisleless choirs. Both exhibited work of the thirteenth century, but as they now stood they were mainly of the fifteenth. The triforium of Paisley was fantastic, and in both this feature was extremely rude. The corbelled passage over this at Paisley was unique in Scotland, and was composed of castellated details. The curious unsymmetrical west end of Dunkeld was shown to be the result of an alteration made after the building had been erected, and the west front of Paisley showed work extending over a period of two hundred years. Aberdeen Cathedral was a building entirely of the fifteenth century, unless it might be a small part at the east end of the nave, which was begun in freestone, out of which they got more refinement of detail than from the hard granite of which most of the church was built. Aberdeen was not to be judged from small details, but from its imposing bulk, and from the massiveness of its towers and spires. The west gable, with its seven lofty windows, recalled the five sisters in the north transept of York. Both had the same effect of great height with absolute simplicity, and of finishing in a horizontal line. St. Giles, Edinburgh, afforded one of the best examples of the great alterations to which churches were often subjected in the Middle Ages, and how from a low and comparatively small church it grew, by additions on the one hand and now on the other, and again by the heightening of its whole roof, to be a many-aisled and widespread church, almost the whole vast area of which appeared at some period or other to have been vaulted in stone—a mode of finishing so often shirked in most of our large churches. It was shown that the architecture of St. Giles was carried out with details and parts somewhat after the style of Melrose and Linlithgow, and but for the clean sweep made of all these, it would have ranked in interest and beauty, as it did in size, as almost the principal church built in the Scottish manner. In the course of these lectures the question must sometimes have occurred—What was the meaning of all this abbey building going on for centuries? They might be sure that the successive kings and statesmen had other motives than to express their delight in architecture. Every abbey they founded was as a camp for Christian soldiers sent out on behalf of the purposes of civilisation—sometimes into the midst of heathendom, and always into the midst of oppression; and with such surroundings the effect must have been, and was, most salutary—that of a great abbey, with its well-ordered and beautiful buildings, its cultivated lands, and many activities.—*The Scotsman.*

BOOKS RECEIVED.

TRAVERSE TABLES, FOR USE IN MINE SURVEYING. By William Lintern. (Crosby Lockwood & Son.)

CONSUMERS' HANDBOOK OF THE LAW RELATING TO GAS, WATER, AND ELECTRIC LIGHTING. By Laurence Duckworth, Barrister-at-law. (Effingham Wilson.)

THE STEAM LAUNDRY. By John Taylor. (Heywood & Co.)

SURREY'S CAPITAL: A GUIDE TO GUILDFORD. By Joseph E. Morris. (The St. Bride's Press).

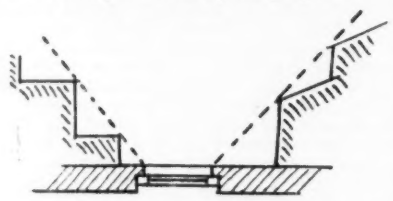
RESTORATION OF A SCOTTISH POET'S MONUMENT.—Subscriptions are being collected for the restoration of the monument in the Old Churchyard of Longside (Aberdeenshire), to the memory of the Rev. John Skinner, author of "Tullochgorum" and other Scotch songs and poems. The monument, which was erected in 1807, has become dilapidated, and on the recommendation of Mr. Arthur Clyne, architect, Aberdeen, it is proposed to take it down to the foundation, rebuild it, and insert a new panel of Sicilian marble of a more durable nature than the former one, but with a corresponding inscription.

Correspondence.

To the Editor of THE BUILDER.

ANCIENT LIGHTS.

SIR,—In the papers and discussion reported in your last issue it is assumed by some that if there is now no rule of 45 deg. there should be, and that it would be reasonable in most ordinary cases that a building owner should be allowed to build within that angle. This view of the question, however, leaves out of consideration all existing obstructions directly opposite or lateral, whether by the buildings of the objecting owner or belonging to others. I submit that it should be put in this way, viz., that if a quadrant of an imaginary inverted frustum of a cone of unlimited vertical dimension (the sides of the cone being 45 deg.) be applied to the window sill or lowest line of glass of the window as in sketch, and no existing or proposed obstruction be found to project into the same, then in all ordinary cases sufficient light may be considered as left to the window, and that very strong evidence should be required in proof of any greater right having been gained for light in very large quantity, or at some lower angle for some special purpose.



A mere unrestricted rule of 45 deg. applied to a proposed obstruction when the window is already so obstructed as to have but little light left to it would leave out of consideration the disastrous result which might be caused by a comparatively small further obstruction, although it might be under that angle. ARTHUR HARSTON.

BRICKLAYERS' STRIKE.

SIR,—It is to be hoped that the attention of the Operative Bricklayers' Secretary has been called to the intimidation case, Bignall and Bownes, which was reported in your last issue.

We believe in live and let live, but the position taken up by the O.B.S. is likely to starve the tile-fixers out.

For thirty years at least the tile-fixers have been quite a separate trade from the regular bricklayers; in fact, they have even a trade union of their own, but now the O.B.S. comes forward with a new rule, preventing the men from building the house because they seem to think they ought to do the decoration of the interior as well as the building of the exterior and other walls.

Surely the bricklayers do not realise the position they have taken up. The tile-fixers in no way want to interfere with the bricklayers, their labour requires peculiar skill and practice, and is entirely decorative.

There are several jobs in London where tile-fixers are fixing the tiles and the bricklayers refused to come out, as they stated they could not do the work.

It seems as if the O.B.S. want to read, learn, and inwardly digest the Tenth Commandment.

JOHN BENNETT & CO.

The Student's Column.

DETAILS OF STRUCTURAL IRON AND STEEL.

12.—RIVETTED JOINTS (*continued*).

THE practical, as distinguished from the theoretical, proportions of rivetted joints vary according to the class of work for which they are intended. We have already seen that the theoretical efficiency of a joint is calculated upon the shearing strength of the rivet, the tensile strength of the plate, and the crushing strength of the plate. The strength of an iron or steel rivet when in the joint is not necessarily the same as that exhibited by a bar of the material, or by a rivet before it has been fixed in place. Similarly, the unit strength of iron and steel plate differs according as the plate is (1) unperforated, (2) perforated but not rivetted, and (3) perforated and rivetted; and according to differences of mechanical treatment in the acts of perforation and rivetting. Our business is now to find the strength of rivets and plates when actually in the joint, by comparison of existing records; and to deduce some simple standard which may be applied to the necessities of everyday work. So many variations are possible in the quality of material, and in the mode of mechanical treatment, that no one can be surprised if somewhat conflicting testimony appears to be furnished by the labours of experimentalists. This state of things is accentuated by the fact that no standard basis of procedure has been established, and the significance of ascertained results is thereby considerably discounted. If, however, information from various sources be collected together, data will be found for the calculation of fairly reliable averages. Commencing in this way with the shearing strength of rivets, considerable divergencies are noticeable in the results, some of which are summarised by a joint process of analysis and condensation in Tables XXIX. and XXX.

According to Table XXIX. no great difference exists in the shearing strength of iron rivets closed by hand, machine, or hydraulic power. Steam rivetting appears in an unfavourable light, and curiously enough, owing to the inclusion in the table of results given by Greig & Eyth, whom we have previously quoted as having expressed the general opinion that "the rivet itself is stronger when put in by the steam rivetter." Of course, it must be borne in mind that rivetting for experimental work is more carefully performed than it would be in the ordinary way. Therefore, unless tests are made for the specific purpose of ascertaining the relative values of various modes of rivetting, it is not clear that any very marked differences will be evidenced so far as shearing strength is concerned. With regard to methods of perforation and their influence upon shearing strength it is clear than an advantage is presented by punched over-drilled holes, though if the "arrises" of the latter were scraped or slightly countersunk, it is probable that the rivet strength would be equal to that of rivets in punched holes. As for the form of the joint, some of the higher results give a disproportionate value to single rivetted lap-joints and the figures require qualification. Turning to Table XXX., we find that the relative effects of the four modes of rivetting are not very clearly demonstrated, but in other respects the averages are more correctly proportionate than those observed in the previous table. It is probable that the following approximate values should not be exceeded in calculations of the shearing strength of iron and steel rivets in joints :—

		Shearing strength per sq. in. of rivet area. Iron.	Steel.
Single Shear.			
Single-rivetted lap joint,	punched holes	19 tons	23 tons
" " " "	drilled "	18 "	22 "
Double " " "	punched "	19 "	24 "
" " " "	drilled "	18 "	23 "
Single-rivetted butt "	punched "	18 "	22 "
" " " "	drilled "	17 "	21 "
Double " " "	punched "	19 "	24 "
Double Shear.			
Double-rivetted butt "	punched "	19 "	24 "
" " " "	drilled "	18 "	23 "

Some experiments made by Stoney for the Royal Irish Academy illustrate in a striking manner the differences of tensile strength exhibited by unperforated, perforated, and rivetted perforated plates. Samples taken from the same plate were perforated, and in some of them hot rivets were inserted and closed up. Compared with a test specimen of the solid plate the variations of tensile strength were as follows :—

	Strength per sq. in. of net section.
Unperforated plate.....	24·0 tons
Punched plate, without rivets ...	22·1 "
Drilled plate " " ...	23·8 "
Punched plate, with rivets	25·16 "
Drilled plate " "	28·84 "

The result here observed may be attributed to one or more of three causes : (1) to the contraction of the rivets, causing friction on the

Table XXIX.—Shearing Strength of Iron Rivets in the Joint, in Tons per Square Inch of Rivet Area.

Authority.	Mode of Riveting. Hand.	Steam.	Machine.	Hydraulic.	Holes. Drilled.	Punched.	Single Shear Joints. Single Rivetted Lap.	Double Rivetted Lap.	Single Rivetted Butt.	Double Shear Joints. Single & Double Rivetted Butt.	Remarks.
Brunel	—	—	—	—	—	20·60	—	—	—	20·60	
Denny	—	—	—	19·30	19·30	—	—	—	—	19·30	Iron rivets in steel plate.
"	18·70	—	—	—	18·70	—	—	—	—	18·70	Do. do.
Fairbairn.....	20·34	—	19·05	—	19·48	—	19·48	—	—	—	Kind of machine not stated.
"	20·90	—	19·53	—	—	20·45	20·45	—	—	—	Do. do.
Greig & Eyth	—	17·87	—	19·35	18·43	—	18·43	—	—	—	
Kirkaldy	—	17·92	—	—	—	17·92	—	—	17·92	—	
Knight.....	—	—	—	—	—	18·60	—	18·60	—	—	
"	—	—	—	—	—	19·36	—	19·36	—	—	Iron rivets in steel plate.
"	—	—	—	—	—	19·54	—	19·54	—	—	Do. do.
Martell	—	—	—	—	—	19·20	—	19·20	—	—	Do. do.
Stoney	18·28	—	—	—	18·28	—	18·28	—	—	—	
"	18·84	—	—	—	—	18·84	18·84	—	—	—	
"	19·35	—	—	—	—	19·35	—	19·35	—	—	
Average.....	19·4	17·89	19·29	19·31	18·83	19·31	19·09	19·21	17·92	19·50	

Table XXX.—Shearing Strength of Steel Rivets in the Joint, in Tons per Square Inch of Rivet Area :—

Authority.	Mode of Modelling. Hand.	Steam.	Machine.	Hydraulic.	Holes. Drilled.	Punched.	Single Shear Joints. Single Rivetted Lap.	Double Rivetted Lap.	Single Rivetted Butt.	Double Shear Joints. Single & Double Rivetted Butt.	Remarks.
Denny	—	—	23·95	—	23·95	—	—	—	—	23·95	Kind of machine not stated.
"	22·45	—	—	—	22·45	—	—	—	—	22·45	
Greig & Eyth	—	23·74	23·13	23·29	23·71	—	—	—	—	23·71	
"	—	—	—	—	—	25·62	25·62	—	—	—	
"	—	—	—	—	23·67	—	23·67	—	—	—	
"	—	—	—	—	22·72	—	—	—	22·72	—	(Double rivetted butt 24·93
Kennedy	22·02	—	—	—	22·02	—	22·02	—	—	—	
"	24·80	—	—	—	24·80	—	—	24·80	—	—	
"	—	—	—	21·33	21·33	—	—	21·33	—	—	
Kirkaldy	—	—	23·20	—	—	23·20	23·20	—	—	—	Kind of machine not stated
"	—	—	26·00	—	—	26·00	—	26·00	—	—	Do. " "
"	—	—	—	—	—	—	—	—	—	24·60	Holes punched, some punch and drilled.
Martell.....	—	—	—	—	—	24·10	—	24·10	—	—	
.....	—	—	—	—	24·25	—	—	24·25	—	—	
Average.....	23·09	25·74	24·07	22·31	23·21	24·73	23·62	24·09	22·72	23·67	

metal around the holes; (2) to the annealing effect of the hot rivets on the plate; and (3) to the suppression of elongation under longitudinal stress. Whatever be the correct explanation, the effect itself is important to the structural engineer. The tensile strength of iron plates in the joint is more fully shewn by a collection of data in Table XXXI. As in the case of rivets we find that strength is influenced by the mode of perforation, and by the form of joint. Unfortunately, experimental evidence on these points is by no means of uniform character, and it is absolutely essential that allowance must be made for some preponderating results if reliable averages are to be deduced. We see that tenacity is more reduced by punching than by drilling, but as some high entries in the first column are not balanced by corresponding figures in the second, the real difference of tenacity is not fairly represented by the general averages of the two columns. The same trouble arises when the respective values of various kinds of joint are sought, and allowance must again be made for the fragmentary nature of existing records, but the figures stated below may safely be adopted when calculating the strength of iron plates in the joint :—

Form of Joint.	Tensile strength per sq. in. of net section. Punched.	Drilled.
Single rivetted lap ...	18 tons	19 tons
Double „ „ ...	19 „	20 „
Single covered butt...	18 „	19 „
Double „ „ ...	19 „	20 „

Turning to records bearing upon the tensile strength of steel plates in the joint, we find it more easy to arrive at satisfactory conclusions, because investigation has been conducted in a more complete and therefore more intelligible manner. Table XXXII. contains some general data furnished by well-known experiments, and it will be seen that a very marked difference occurs between the tensile strength of punched and drilled plates in the joint. Even omitting from consideration 1 in. plates, which exhibit exceptionally low results, punched plates have an average tensile strength of only about 29 tons as against about 32 tons in the case of drilled plates, the average unit-strength of the former being approximately equal to that of the unperforated plate, whilst the average unit-strength of the latter exceeds that of the original plate by about 3·5 tons. Examination of the Board of Trade tests in the same table, will show that this excess of strength diminishes the thickness of the plate is increased. This circumstance should by no means be overlooked.

The standards given below may be adopted as applicable to the tensile strength, in the joint, of steel plates up to ¾ in. thick :—

Form of Joint.	Tensile Strength per sq. in. of net section. Drilled Holes.	Punched Holes.
Single rivetted lap	30 tons.	27 tons.
Double „ „	29 „	27 „
Single „ butt-one cover	30 „	27 „
Double „ butt-two covers	29 „	27 „

The above figures are based upon a strength of 28 tons in the original plate, and allowance is made in the case of double rivetted joints with drilled holes, for smaller increments of strength, because less benefit is derived from perforation, owing to the greater pitch of the rivets. Excess tenacity of the plate probably disappears entirely when the pitch of the rivets is as wide as generally adopted in building work.

Rivets are always subjected to tensile stress caused by contraction of the metal in the act of cooling, and when the rivets are of considerable length the heads are sometimes drawn off. Contraction ought to be proportionate to length, and it is not perfectly clear why failure should result in this way; but the most likely explanation is that tension may be concentrated beneath the head where heat is less rapidly dissipated than in other parts. Again, rivets are subjected to tensile stress when a lap-joint becomes bent, and when employed in details of structural work so that they have to support weights. It would never be safe to take the tensile strength of the material as representing the actual resistance in any of these cases, for the true measure must be the strength of the weakest part. Data for the establishment of this measure are very scarce, but Stoney says that in some experiments made by him, with ¾-in. iron rivets in punched holes, the heads flew off with an average pull of 7 tons per rivet, or 12·32 tons per square inch of rivet area, and he adopts a factor of safety of 5 for this class of work in girders. If rivets are used for supporting weights, care should always be taken to make the heads of adequate proportions. Counter-sunk heads are particularly unsuitable as they are liable to be drawn through the holes by a pressure less than that required to fracture the rivets themselves.

Another matter for consideration is the effect produced upon plates of iron and steel by the bearing pressure of rivets. When joints are tested to the breaking point, the bearing pressure per square inch does not as a rule exceed :—

30 tons for iron } in single shear.
40 „ „ steel }
40 „ „ iron } in double shear.
50 „ „ steel }

If these pressures be exceeded, it is believed that tenacity of the plate becomes reduced, and although rupture may not actually ensue, the plate will probably be crippled. The above measurements represent crushing strength given provisionally in Table XXVIII., where two figures on the third line were inadvertently stated somewhat above the safe value. Heavy bearing pressure has also a detrimental effect on the resistance of rivets to shearing stress, and there is every reason for fixing a limit beyond which strain should not be permitted. It is quite possible that excessive bearing pressure may unintentionally be produced as the result of insufficient care in calculating the rivet area necessary to resist the stress resulting from a given load. That this contingency may very easily arise will be evident if we remember that the plate resists bearing pressure in proportion to the diameter of the rivet × thickness of the plate, whilst the rivet resists shearing stress proportionately to its area. Therefore if the thickness of the plate be constant, the shearing area of the rivet may increase much more rapidly than does the bearing area. To illustrate this point let us take three examples of iron rivets and plates of lap-joints :—

Ex. 1.—Rivet ½ in. dia. in joint of ¼-in. plate: Shearing area of the rivet = $(·5)^2 \times ·7854 = ·1963$, and its shearing strength = $·1963 \times 19$ (Table XXVIII.) = 3·72 tons. Bearing area = $·5 \times ·25 = ·125$, and crushing strength of the plate = $·125 \times 30$ (Table XXVIII.) = 3·75 tons. Here the proportion is quite safe and in accordance with theory.

Ex. 2.—Rivet ⅞ in. dia. in ¼-in. plate: Shearing area of the rivet = ·44, and its shearing strength = $·44 \times 19 = 8·36$ tons. Bearing area = $·75 \times ·25 = ·1875$, and crushing strength of the plate = $·1875 \times 30 = 5·62$ tons. Here a considerably deficiency of strength is observable in the plate as compared with the rivet.

Ex. 3.—1-in. rivet in ¼-in. plate: Shearing area of the rivet = ·7854, and its shearing strength = $·7854 \times 19 = 15$ tons. Bearing area = ·25, and the crushing strength of the plate = $·25 \times 30 = 7·5$ tons. Again a deficiency is to be seen, but much more marked in degree.

In these examples the ultimate shearing and crushing strengths are used, but in practice a factor of safety of from 4 to 5 would, of course, be adopted.

Table XXXI.—Tensile Strength of Perforated Iron Plate in Various Joints, in Tons per Square Inch of Net Section.

Form of Joint.	Holes. Punched.	Holes. Drilled.	Original Plate (calculated).	Authority.
Single-rivetted lap.....	17·55	—	25·7	Fairbairn.
	17·96	—	25·0	Hendry.
	17·16	—	21·4	Master Mechanics' Association.
	22·30	—	26·7	Stoney.
	—	19·39	21·9	„
	16·80	—	22·2	Greig & Eyth.
	—	19·75	22·2	„ „
Double-rivetted lap	23·50	—	25·7	Fairbairn.
	25·57	—	22·0	Kirkaldy.
	16·35	—	18·7	Easton & Anderson.
	12·08	—	21·4	Knight.
	—	21·17	23·3	Greig & Eyth.
Single-covered butt	24·07	—	25·7	Fairbairn.
	19·95	—	22·0	Martell.
	—	18·07	22·2	Greig & Eyth.
Double-covered butt	21·44	—	25·7	Fairbairn.
	19.37	—	22·4	Kirkaldy.
	—	20·65	22·2	Greig & Eyth.
	17·52	—	19·4	Knight.
Average.....	19·4	19·8	22·93	

Table XXXII.—Tensile Strength of Perforated Steel Plate in Various Joints, in Tons per Square Inch of Net Section.

Form of Joint.	Thickness.	Holes. Punched.	Holes. Punched and Annealed.	Holes. Drilled.	Original Plate.	Authority.
	in.					
Single-rivetted lap	⅜	—	—	32·73	29·71	Kennedy.
Double „ (zig-zag).....	⅜	—	—	30·73	27·18	„
„ „ „	⅜	—	—	33·16	29·97	„
„ „ „	⅜	—	—	30·68	28·46	„
	⅞	29·17	—	—	29·1	Kirkaldy.
Triple „ (chain).....	⅞	25·99	—	—	28·4	„
	¼	—	—	35·96	31·6	Board of Trade.
	¼	—	—	34·18	29·1	„
	¼	—	—	30·46	28·6	„
	¼	—	—	29·44	27·7	„
	1	—	—	—	29·9	„
	¼	31·7	32·9	—	28·0	„
	¼	30·3	32·2	—	28·7	„
	¼	27·8	30·6	—	28·4	„
	1	13·6	29·5	—		
Double-rivetted butt with two covers (zig-zag).....	⅜	—	—	30·1	28·24	Kennedy.
Double-rivetted butt with two covers (chain)	⅝	—	—	28·7	27·0	Martell.
Average		26·42	31·3	31·61	28·75	

OBITUARY.

MR. F. W. STEVENS.—We regret to announce the death, at his residence in Nepean-road, Malabar Hill, Bombay, of Mr. Fredk. Wm. Stevens, C.I.E., in his fifty-third year. Mr. Stevens, a native of Bath, was a Fellow of the Institute of Architects, and an A.M.Inst.C.E. In 1889 he was made C.I.E. for his services in relation to the public buildings in Bombay. Having entered the Public Works Department of India, by competition in 1867, as an assistant engineer, he was promoted five years later Executive Engineer, Bombay; in 1877 his services were lent by the Government to the Great Indian Peninsular Railway Company for designing and erecting their Victoria Terminus buildings, Bombay (1879-88), which are illustrated and described in the *Builder*, October 23, 1886, and September 8 and October 13, 1888. Of his other chief works we may here mention the Municipal buildings, Bombay (begun in 1889), the Standard Insurance buildings, Dalhousie-street, Calcutta (1894-6), illustrated in our columns of October 22, 1898, the New Government House, at Naini-Tal, for the Lieutenant-Governor, and new offices, in Bombay, for the

Bombay, Baroda, and Central India Railway Company. We understand, further, that his plans and designs were recently approved by the Chartered Bank of India, Australia, China, and Bombay, for their new offices in Bombay. Mr Stevens retired from the Indian Civil Service in 1884, when he had been appointed a Government member of the Bombay Municipal Corporation; in 1887 the Government appointed him a member of the Select Committee for the future extension of Bombay.

MR. EDWARD J. LOWTHER.—We have also to announce the death on the 23rd inst. at his residence, Withrington, Sutton, Surrey, in his fifty-fourth year, of Mr. Edward J. Lowther, C.C., who was elected a Fellow of the Institute of Architects on December 4, 1899. Mr. Lowther was a partner in the firm of Messrs. Gordon, Lowther, & Gunton, who in August last were appointed architects for the proposed new Portman Market, Church-street, Marylebone, to be erected upon the former site at an estimated maximum cost of 65,000*l*. In January, 1898, his firm's designs were selected in competition —Mr. Rowland Plumbe being the assessor—for the Centenary Schools of the Royal Masonic Institution for Boys, at Bushey. The firm were also successful in the competition (1897) for a large Wesleyan Methodist church, with Sunday schools for 550 children, church parlour, and vestries, in High-street, Chelmsford.

GENERAL BUILDING NEWS.

ST. ALDHELM'S CHURCH, BEDMINSTER.—On the 8th inst. Dr. Forrest Browne, the Lord Bishop of the diocese, dedicated the Mission Church of St. Aldhelm's, Chessell's Road, Bedminster. The building is in the Gothic style, red Winterbourne stone being used, with Bath-stone dressings. It has an open timber roof, left in its natural state, covered with Major's patent interlocking plain tiles. At the east end, and raised three steps above the floor of the nave, is a chancel to be fitted with choir stalls, room being left for an organ. The sanctuary is raised one step above the floor of the chancel, and divided therefrom by an oak rail resting upon wrought-iron standards of ornamental design. The church has an aisle on the south side, divided from the nave by arches and columns of Bath stone. The aisle is divided by sliding swivel partitions, forming five classrooms for Sunday-school purposes, each classroom being 16 ft. square, and having separate windows. At the west end are two vestries for the clergy and choir. Beneath the vestries are a kitchen, a heating chamber, and various offices. The clergy and choir vestries have separate entrances. On the north side is the main entrance porch, the floor of which is laid with encaustic tiles, and also the entrance lobbies to the vestries. The heating is by hot water on the low pressure system. The church has been planned to seat 700 people. The architects were Messrs. P. Munro and Son, of Bristol; the contractor, Mr. E. Walters, of Montpelier; and the heating apparatus by Messrs. Willway and Sons.

CHURCH, EASTON, BRISTOL.—The foundation stone of All Hallows' Church, Easton, Bristol, was laid on the 17th inst. It is not intended at present to carry the whole design for the new church into execution. The building will ultimately accommodate 800 persons. At present, however, only the choir, sanctuary, transepts, and the bay of the nave are to be built. The building will be of Pennant stone, with red Pennant facings and Bath stone dressings. The church will have an open timber roof, with apsidal eastern terminations, and ambulatory round it. There will be a side chapel on the south of the choir. The architect is Mr. G. H. Oatley, the builders are Messrs. R. Wilkins & Sons, of Bristol, and the clerk of the works is Mr. A. Pritchard. The present work will cost about 6,000*l*.

PRIMITIVE METHODIST CHAPEL, KEGWORTH, LEICESTERSHIRE.—The memorial stones were laid on the 24th inst. of a new Primitive Methodist chapel, in the Nottingham-road, Kegworth. Mr. A. E. Foulks, of Loughborough, is the architect, and Mr. G. Bramley, of Kegworth, is the contractor.

SCHOOLS, GLASGOW.—The new public school which has been erected in Dunard-street by the School Board of Glasgow was opened on the 16th inst. The new building, which has been erected from plans prepared by Messrs. H. B. W. Steel & Balfour, architects, Glasgow, is in the Classic style. It has three floors. On the first there are five class-rooms, with accommodation for 522 infants; on the second, accommodation is provided for 486 juniors; and on the uppermost floor a similar number of seniors can be accommodated—a total of 1,494. In addition to the cloak-rooms at the south, west, and east of the building, there are others on each landing. Part of the basement is to be used as a laundry and cookery-room, and the remainder is taken up with apparatus for the heating and ventilating, which is on the propulsion system. The cost of the site and building will be about 27,000*l*.

RESTORATION OF KNOWLE CHURCH, BIRMINGHAM.—On Saturday last, at Knowle Church, the new organ chamber, clergy and choir vestries, and lectern were dedicated. The cost of the work of restoration has been between 900*l*. and 1,000*l*. Messrs. Collins & Godfrey, of Tewkesbury, have carried out the contract, from plans prepared by Mr. J. A. Chatwin, architect, of Birmingham. The organ and choir have been removed from the north transept to the north side of the chancel. By this arrangement the north chapel, with its traceried window, has been opened out to the church, and the old stalls removed from the end of the south aisle to the choir. In the course of the work a piscina and ambry were discovered, and it is conjectured that the south aisle was at one time a chapel connected with the Knowle Guild. The vestries are lighted by means of traceried windows.

VOLUNTEER DRILL HALL, FRASERBURGH, ABERDEENSHIRE.—A drill hall for the 3rd Volunteer Battalion Gordon Highlanders is to be erected in Gratton-street, Fraserburgh. The architect is Mr. Geerge Sutherland, of Elgin. The hall will measure 70 ft. by 50 ft.

REVOLVING TOWER, CLEETHORPES, LINCOLNSHIRE.—We are informed that Messrs. Clarke & Warwick are only acting as architects for the pavilion in connexion with this work, and have nothing to do with the design or construction of the tower.

PRESBYTERIAN HALL, CARDIFF. — Foundation stones were laid on the 21st inst. of a mission hall in Monthermer-road, Cardiff. The architects are Messrs. Habershon, Fawckner, & Groves, and Messrs. Handford & Elsworthy are the builders.

ST. JOSEPH'S FEMALE ORPHANAGE, DUBLIN.—The foundation stone was laid recently of the new Convent Chapel, St. Joseph's Female Orphanage, Mountjoy-street, Dublin. The work is being carried out by Mr. K. Toole, Dublin, from the designs and under the superintendence of Mr. William Byrne.

PROPOSED NEW CHURCHES IN ABERDEEN.—The Free Presbytery of Aberdeen having sanctioned the erection of a new church in Urquhart-road, King-street, for the Commerce-street congregation, the Free North Church congregation have, from apprehension that two churches would be too many for the district, abandoned the scheme for building a new church in King-street, opposite Summerfield-terrace. Tenders have just been accepted for the erection, in Broomhill-road, of a new church for Ruthrieston Free Church congregation. The architects are Messrs. Brown & Watt, Aberdeen. The church will contain 550 sittings, and provision is made for the construction, at any future time, of an end gallery. The estimated total cost is 3,600*l*. A new free church is also to be built at Cults, in the suburbs of the city. Out of the designs submitted, that of Messrs. D. & J. R. McMillan, architects, Aberdeen, for a building (600 sittings) in the Early English Gothic style has been selected, and the total cost, including halls, &c. is estimated at 4,000*l*.

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, SELSTON, NOTTINGHAM.—Colonel J. T. Marsh, R.E., an inspector to the Local Government Board, recently held an inquiry at Selston into an application by the Basford Rural District Council for sanction to borrow 7,000*l*. for the sewerage and sewage disposal of the Bull and Butcher and Jacksdale districts of Selston. The engineer is Mr. H. Walker, of Nottingham.

ABERDEEN HARBOUR IMPROVEMENTS.—On the recommendation of Mr. R. G. Nicol, harbour engineer, it has been resolved to shift the single-story goods shed on Regent Quay to a site near Weigh-house-square, the cost (including relaying of rails) being 1,060*l*., and to construct a wooden jetty and to lay a line of railway and connexions at the pontoon dock at an expense of 460*l*. Consideration was postponed of a recommendation to provide a 10-ton locomotive crane (cost, 950*l*.) for the pontoon dock. The new two-story goods shed at Regent Quay is to be lighted by electricity, the expense of fittings being 230*l*.

SELKIRK WATER SUPPLY.—The Selkirk Town Council have engaged Mr. Harry W. Taylor, of Newcastle-on-Tyne, to prepare a supplementary water supply for that town. Under this scheme water will be taken from the Ettrick River, passed through polarite filters, and then be pumped by turbines and gas engines to the reservoir. The estimated cost is about 11,000*l*.

FOREIGN.

FRANCE.—A statue of Galileo is to be erected at Paris, in the neighbourhood of the Observatory.—— The "Vieux Paris" Committee has decided to extend its operations beyond the city boundaries, and to endeavour to safeguard any sites or buildings of interest in the suburbs.——M. de Nolhac, the curator of the Versailles Museum, has just completed the arrangement of eight new rooms, four in the north attic, and four on the ground floor of the palace. These are to be devoted to paintings of the eighteenth century. It may be added that during the great Exhibition it is intended that the Versailles fountains are to be seen in full play once a fortnight.——Archæologists are much concerned about a threat of the municipality of Rouen to pull down the ancient houses in Rue St. Romain, near the Cathedral. Strong protests are being made on the subject both in Rouen and in Paris.——The eight decorative panels for the Salle des Fêtes of the great Exhibition have just been completed by the following eminent artists: — MM. Cormon, F. Flameng, Rochegrosse, Albert Maignan, Thirion, Maillard, Surand, and Hirsch. M. Marqueste, the sculptor, has just completed the model for the monumental group symbolising "La Fée du Siècle," to be executed in zinc and form the finial to the Palais de l'Electricité.——The death is announced, at the age of seventy-six, of M. Hébert, a member of the "Union Syndicate des Architectes Français," and who was for many years attached to the management of the journal *Le Bâtiment*.

INDIA.—The bridge across the river Kosi, now being constructed by the Bengal and North-Western Railway Company, will consist of fifteen 200-ft. clear spans. The piers, which are 39 ft. in height, are founded on single wells 26 ft. 6 in. diameter, sunk 95 ft. below low-water level. The bridge crosses the river about 1¾ miles above the junction of the latter with the Ganges.——The proposal of the Royal Asiatic Society to establish a standard time for all India has been definitely rejected by the Indian Government.——The church of St. Francis Xavier, Calcutta, is practically finished, and will shortly be opened. It is in two stories, and is treated after the Italian style with a lower Ionic order surmounted by a Corinthian one. The enrichments are of cement; the capitals, cornices, consoles, &c., were modelled by a native student of the Calcutta School of Art, whilst the general design of the building was by the Rev. Mr. Molliter, S.J. ——Electric tramways are about to be constructed in Mandalay, the scheme submitted by a local syndicate having been sanctioned by the municipal committee.——Extensive waterworks are about to be carried out at Dargai, Malakhand.——A new railway is about to be constructed from Peshawar to Jamrud, starting from the Cantonment station near the first-mentioned place.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT. —The business of Messrs. Thorn & Hoddle, acetylene gas engineers, of Westminster, is being converted into a limited company, in consequence of the growth of the undertaking during the last few years.

THE YORKSHIRE FEDERATION OF BUILDING TRADES.—The annual dinner of the Sheffield Master Builders' Association was held on the 21st inst., with the President, Mr. James Longden, in the chair. Others present included Mr. W. Nicholson, of Leeds, the President of the Yorkshire Federation of Building Trades.—In reply to the toast of "The Yorkshire Federation of Building Trades," Mr. Nicholson referred to the recent work of the Federation, and said in consequence of the formation of a body of employers numbering about 1,400 firms, the men had seen that in future disputes would assume a totally different aspect. In connexion with the foremen a scheme had been prepared which would be brought forward at an early date, and another scheme in regard to the relations between contractors and sub-contractors. The latter embodied three points by which friction would be avoided in the future. It was not proposed to deal with the wages question unless the unions brought forward excessive and ridiculous demands.

NATIONAL GALLERY.—Sir E. J. Poynter, R.A., Director of the National Gallery, in reporting upon works carried out under his instructions in the course of last year, says it was found that the position of the hot-water pipes against the walls of Rooms XIII. and XIV. at Trafalgar-square resulted in an over-heating of the walls, which endangered the preservation of the pictures hung upon them. Several pictures showed signs of having suffered from this cause, and it was found necessary to remove the pipes to the middle of the floor of each room. This alteration, which presented grave difficulties, was successfully accomplished by her Majesty Office of Works before the cold weather rendered heating necessary in the autumn. The consent of her Majesty's Treasury was obtained last spring to an experimental treatment of the floors of Rooms I. and II. at Trafalgar-square. It had long been felt that the conditions of the gallery floors was unsatisfactory. They were too light in colour and interfered with the view of the pictures by reflection. They were costly in labour for washing and sweeping, and yet were so dirty that the cleanliness of frames, glasses, and decorations was seriously affected. The experiment of giving the floors a low polish has been successfnl in every way, and her Majesty's Government have authorised a similar treatment of the floors of all the exhibition rooms, both at Trafalgar-square and at the Gallery of British Art, from the beginning of this year.

TIMBER SALE.—At Horsham, Sussex, Messrs. Weller & Son held a sale of timber standing on the Abinger Estate, near Ockley, Surrey, the North Breache Manor and Old House Estates, Ewhurst, Surrey, and the Highland Estate, near Horsham. The lots comprised 1,288 oak, 34 ash, and 536 Scotch fir trees, and the total amount realised was 3325*l*., the buyers being Messrs. J. T. Brooker, Dorking; Box & Turner, Ardingley; J. & S. Elliott, Cranleigh; James Longley & Sons, Horsham; Wiltshire, Epsom; and J. & S. Agate, Horsham.

THE SANITARY INSPECTORS' EXAMINATION BOARD.—The next Examination for Certificates of qualification for appointment of Sanitary Inspector or Inspector of Nuisances, under Section 108 (2) (d) of the Public Health (London) Act, 1891, will be

held in London on Tuesday, 1st May, 1900, and the four following days. Particulars will be forwarded on application to the Hon. Secretary, Mr. Wm. R. E. Coles, 1, Adelaide Buildings, London Bridge, London, E.C.

COMPANIES REGISTERED.—A company was registered, on the 22nd inst., under the title of John Hutchinson & Co., Limited, to acquire and carry on the business of merchants and dealers in stone, sand, lime, bricks, timber, hardware, and other building requisites, now carried on by "John Hutchinson & Co."——On the 22nd inst. a company was registered under the title of "The Kelham Brick Co. Limited," to acquire a lease of certain land in Kelham (Nottingham) with a view to working and turning to account the brick earth, gypsum, or other mineral matters found there. The office is "Brick Works, Kelham, near Newark, Nottingham."——On the 26th inst. a company was registered under the title of "W. & T. Garrett, Limited," to acquire and carry on the business of builders and other auxiliary businesses now carried on under the style of "W. & T. Garrett" at Brighton.

CHANCEL SCREEN, ST. PETER'S CHURCH, MORLEY, YORKSHIRE.—A chancel screen of English oak has been placed in St. Peter's Church, Morley. There are five gabled openings, the centre opening being wider and higher than the others. The four outer openings are sub-divided by columns carrying arches, the centre opening being used as a passage from the main portion of the church to the chancel. At the springers to the gables and above a carved cornice is a series of heads representing the Twelve Apostles. The work was carried out by Messrs. Harry Hems & Sons, of Exeter, from designs by Mr. Harrison Morton, of Huddersfield.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The Bristol Master Builders' Association has had a diploma prepared for its members. It is in blue and gold, and bears the arms of the city of Bristol.

SOUTH LONDON TECHNICAL ART SCHOOL.—The annual Report on this school shows that it has been a very important influence in the training of the younger generation of sculptors, four of whom took the gold medal in sculpture successively at the Royal Academy, and all have made a high reputation since, viz., Messrs. Harry Bates, Frampton, Pomeroy, and Goscombe John; and after an interval another student, Mr. Turner, again obtained the gold medal. The last named has been recommended by Mr. Sparkes, the superintendent (who signs the Report) to execute in marble two figures for the decoration of the staircase of the Fishmongers' Company. Reference is made to the sad death of Mr. Harry Bates, and we read with regret Mr. Sparkes's remark that he feared the serious struggles the artist had to go through in the earlier part of his career had something to do with shortening his life. In the course of the Report we read that "an attempt was made to deal with the obvious and confessed ignorance, of the art side of their calling, of the plasterers. Thanks to the liberality of the Plasterers' Company, scholarships were offered to apprentices and improvers. A scheme of work was drawn up, an examination arranged, and about forty young men entered their names for the competition. On the appointed night not one came. Under orders of their masters or foremen, it was said, they had been forbidden; "so the scheme, upon which I and others had spent considerable time and thought, was abortive. The plasterers' trade remains very much behind still, and is, I fear, a handicraft without taste to guide it."

CARDIFF BUILDING BY-LAWS.—It was announced at the Cardiff Public Works Committee meeting on Thursday last week that the by-laws applicable to new streets and buildings had been confirmed by the Local Government Board. The Chairman (Alderman Ramsdale) stated that those by-laws had been under consideration for twenty-two years. They were dated March 21, and would come into operation immediately. He was glad to say that the committee had secured nearly everything they had been fighting for. It was resolved that copies be forwarded to the architects and builders of the town. The Corporation had the power previously, says the *South Wales Daily News*, to compel every person laying out a new street to make the roadway at least 40 ft. wide, but the new by-laws give them something more. Where a new street is intended to be used as a carriage-road and exceeds 300 yards in length, or where it is in continuation of an existing street and of a length, including such new street, of not less than 300 yards, the width shall be 50 ft. at the least. Any extension of Clive-street or Portmanmoor-road must be at least 60 ft. in width. It is in connexion with new buildings, however, that the most important alterations have been made. Hitherto the Local Authority has been helpless in the matter of low-lying lands upon which dwelling-houses have been built, with the result that in many parts of the town there is in wet weather a quantity of water immediately underneath the flooring boards. Under the new regulations sites for dwelling-houses which are less than 25 ft. above Ordnance datum must be brought up to that level. The material to be used in filling up the land to the required level must be sound and suitable for the purpose, and in every case where a domestic building is to be erected the whole surface or site of such building must be properly asphalted or covered with a layer of good cement, rammed solid, and at least 6 in. thick. These conditions will put an end to such scandals as were exposed a short time ago at Grangetown, where the boards rotted and the walls streamed with damp in consequence of the wet soil and water underneath. Six inches of concrete or asphalt will prevent any damp arising from the soil and making the dwellings unsafe for habitation. To more securely protect the occupier, however, provision is made for a damp-course. There are important clauses dealing with the thickness of the walls, but this, of course, varies according to the number of stories. With regard to ordinary cottage property, the outer walls will, if anything, be thinner than the Corporation have been in the habit of requiring, but in warehouses built to a great height the thickness, on the whole, will be increased. With respect to the open space around buildings to secure a free circulation of air, the new by-laws vary considerably from those hitherto in force. It has been the rule to allow four square yards of open space for every five square yards built upon. The new regulation provides that the open space shall not be less than 28 ft. extending laterally throughout the entire width of the building. If the height of the building be 35 ft., the distance shall be 25 ft. In some cases this alteration will reduce the air space. It would appear from the by-law that this rule applies to lock-up shops, and, if so, it will prevent the formation of any more arcades in Cardiff. It certainly applies to domestic buildings, and, according to the interpretation of terms, we find that a domestic building means "a dwelling-house or an office building, or other outbuilding appurtenant to a dwelling-house, whether attached thereto or not, or a shop, or any other building not being a public building, or of the warehouse class." The Corporation have additional powers in reference to the strength of beams, roofs, and floors, and must not allow any combustible substance in the walls. There must, therefore, be no more gables, &c., composed partly of brick (or stone) and wood. The floors of lobbies, corridors, passages, staircases, and supports of every floor and flight of stairs in public buildings must be of stone or other incombustible and fire-resisting material. There are many other points of a minor character, some of which, such as the flushing of closets, are retrospective, and, therefore, apply to existing dwellings.—A deputation from the Master Builders' Association, consisting of Messrs. Lattey (President), Symonds, Turner, D. Davies, and W. Thomas, waited upon the committee with respect to the form of contract adopted by the Corporation. Mr. Lattey stated that what the builders required was that, in the event of a strike or lock-out, the penalty for not completing a contract at the specified time should not be enforced, the architect or engineer to determine what extension should be given. Mr. Crossman failed to see under the existing agreement between the builders and the men how a strike could take place. If a dispute arose and a conciliation committee failed to settle it, provision was made for referring it to arbitration. Mr Veall stated that the clauses which the master builders now desired to insert in Corporation contracts had been recognised in private contracts for at least fifteen or twenty years. Mr. Lattey: For twenty-eight years. All we ask is that the Corporation contracts should be the same as those entered into by other people. Mr. Lattey explained that the only other question, referred to an arbitration clause in the event of a dispute on certain matters. As regards the quality of materials and work, the architect's decision would be binding. Mr. Symonds and Mr. Turner also addressed the committee. The Chairman asked the deputation to submit in writing the points they wished to bring before the committee, when the subject will be fully discussed.

THE BRITISH FIRE PREVENTION COMMITTEE TESTS.—An important series of tests was again undertaken on Wednesday afternoon by the Fire Prevention Committee at its testing station, near Regent's Park. Sir John Taylor (H.M. Office of Works) and Mr. Arthur Cates (Crown Surveyor) represented the Council, and Mr. Edwin O. Sachs the executive. There was an unusually large attendance of members and visitors, including the leading District Surveyors and representatives of the Local Authorities. One of the tests was with a floor of wood joists, with concrete filling and a plaster ceiling on expanded metal lathing; the concrete, however, protected the joists from below. This floor was subjected to a test of a gradually increasing fire reaching to a temperature of 2,000 deg. Fahr. for a period of two hours, followed by the application of water. Two doors were also tested, one of three-thickness deal, 2½ in. thick, and the other of teak with a skeleton of 2 in. solid material, but the panels in two thicknesses. This test was of about an hour's duration. Among the recent tests applied for are two by the British Uralite Company (Uralite boards), and one by Messrs. G. W. Williams & Sons (fire blinds). The next testing day is Wednesday, April 11.

LEICESTER-SQUARE.—The site of Nos. 45-6, Leicester-square (west side), and No. 62, Whitcomb-street, in the rear, covering about 3,400 ft. superficial, has just been cleared, and will shortly be let by auction upon a building lease of eighty years. At the adjoining house, No. 47 (Sir Joshua Reynolds's), a new salesroom is being erected in the rear, over the site formerly occupied by Sir Joshua's stables, by Messrs. Prestige & Co., of Pimlico, contractors, after the designs of, we gather, Mr. Arber. A musical society recently founded by graduate members of Oxford and Cambridge Universities have established themselves at No. 47, where they have rented some of the upper rooms.

CAPITAL AND LABOUR.

EXPECTED STRIKE OF BRICKLAYERS AROUND LONDON.—A strike, we understand, is imminent in the brickmaking trade around London. Having regard to the fall in the price of bricks, the Masters' Association has decided to reduce the pay from 6s. to 5s. 3d. per thousand, and the men have intimated that they will not accept these terms, so that when the season commences in a few days, it is expected they will refuse to work. In Edmonton alone, where there are several brickfields, no fewer than 500 men will be affected.

ABERDEEN JOINERS' STRIKE.—An unexpected development in this strike was a resolution adopted at a meeting on the 22nd inst. of the committee of the Aberdeen Master Builders' Federation recommending the various associations embraced in the federation to lock out the whole of their men in the event of the joiners' strike not being ended by Saturday, 24th inst. The men declined to yield, and several of the Federated Trades met in the beginning of this week. None of the trades interested, however, agreed on a lock-out, and in one or two cases the meeting was adjourned for a few days in the expectation of an amicable settlement being arrived at within that time between the masters and operative joiners.

LEGAL.

DANGEROUS WALL CASE.

COLONEL SHERLOCK, of Vernon House, Lordship-lane, Dulwich, appeared at the South-Western Police-court, last Saturday, to a summons issued by the London County Council in respect of a dangerous wall at Ecclesbourne Park-road, Dulwich, of which he is the owner. Mr. Godfrey supported the summons, and defendant conducted his own case.

Mr. P. Hunter, the District Surveyor, said the wall had been buttressed by defendant two years ago, but since then the ground had slipped and the wall was in peril of falling. Last December he certified it was not dangerous, but a few weeks later he received an anonymous letter and again inspected the wall. He then found it had moved considerably, and he certified that it was dangerous.

The defendant, who denied that the wall was dangerous, complained that the Council refused to send a superior official to inspect it.

Mr. Garrett: Of course not. You can't expect them to go behind the opinion of their District Surveyor.

Mr. Sherlock, barrister, a brother of the defendant, said he did not consider the wall dangerous.

Mr. Godfrey: You are not an architect.

Witness: No, I simply take a common-sense view of the case.

The defendant himself gave evidence, and declared that the wall was not dangerous.

The Magistrate was satisfied that the wall was dangerous, and made an order for the removal of the danger within seven days.

THE CONSTRUCTION OF KEYHAM DOCKS: ACTION AGAINST THE CONTRACTOR.

THE case of the London and Tilbury Lighterage Contracting, and Dredging Company, Limited, *v.* Jackson, came before Mr. Justice Kennedy and a Special Jury in the Queen's Bench Division on the 23rd inst.,—an action brought by the plaintiff company to recover damages from Sir John Jackson for alleged breach of a contract entered into on June 11, 1896, for the purpose of procuring shingle at Exmouth necessary for the manufacture of concrete to be used in the construction of the dock extension at Keyham, Devonport. The defence set up was a denial of the breach alleged, and it was further stated that another agreement was entered into between the parties.

Mr. Rufus Isaacs, Q.C., and Mr. Hamilton appeared for the plaintiff company; and Mr. English Harrison, Q.C., and Mr. L. S. Batten for the defendant.

Mr. Isaacs, in opening the case, said that the breach of the contract in question was of a very serious character and involved a very large sum of money. The plaintiffs were probably the largest dredging contractors in this country and had a plant worth 200,000*l*. They desired to enter into a contract which was about to be made by Sir John Jackson, who was the well-known contractor, to enable him to carry out a contract of between 3,000,000*l*. and 4,000,000*l*. with the Admiralty for the construction of the docks at Keyham which, when completed, would be the largest in the world. A large part of the work for the purpose of constructing the docks was concrete work, and in order to carry out the contract the defendant would have to get either loose stone or gravel to mix with the cement for his concrete. The defendant decided to enter into

a contract to get gravel or shingle delivered at the jetty at Keyham. This material had to be dredged from the bed of a river, and one of the important points of the undertaking was to ascertain the most suitable place for procuring it, as a very large quantity was required, something like 1,250,000 tons being necessary. That being the position, the defendant, who knew the plaintiff company were the most suitable to carry out the work, saw Mr. Hughes, the managing director, and entered into the contract of June 11, 1896, which was the contract in respect of which this action was brought. Inquiries having been made as to the best locality for getting the shingle, the defendant was advised that Exmouth was the place *par excellence* where this gravel could be obtained. The agreement of June 11, 1896, was accordingly entered into, under which the plaintiffs undertook to bring one million cubic yards of gravel from Exmouth to Keyham at the times and in quantities to suit the progress of the work, the price to be paid being 2s. 6d. per cubic yard. It was also provided that if the shingle did not prove satisfactory, the plaintiffs were to go to such other suitable place to procure it, provided it was not more than eighty miles distant from Plymouth Breakwater. Should a suitable place be found within forty miles, then the price was to be fixed equitably by mutual agreement, or, failing that, by arbitration. Provision was also made by which the defendant was made responsible for any royalties or dues that might be payable for the right of removing the material. Early in the history of the case, however, a question arose with regard to Exmouth, which was the place selected for obtaining the gravel. An excellent place for dredging this material was found to be Bull Hill Bank, near Exmouth, but before operations were commenced difficulties arose both with the Corporation of Exeter and the Rolle Estate Trustees, who were interested in Bull Hill Bank. Both these parties raised questions as to the right to excavate gravel. The main difficulty, however, was that the Rolle Estate trustees required a higher royalty for the removal of the gravel than the defendant would agree to. The defendant offered 100*l.* a year to the trustees, but this was not accepted. The result was that the defendant decided to find another place for obtaining the gravel, and down to December, 1896, the plaintiffs worked at Exmouth and Dartmouth experimentally only with a small plant. Subsequently, at the defendant's request, and pending defendant's negotiations with the trustees, the plaintiff's procured shingle from the Thames and from Southampton, which was supplied and taken as part of the contract quantity. At an interview between the defendant and Mr. Hughes on February 25, 1897, the plaintiffs agreed to substitute Torcross for Exmouth in consideration of the defendant paying an additional 9d. per cubic yard on the gravel. This involved the expenditure of 30,000*l.* extra for the purpose of plant to work there. The plaintiffs continued to work at Torcross until August, 1897, when they pointed out to the defendant that there was no agreement to compel them to continue operations there any longer, and also said that the arrangement come to on February 25, 1897, was merely temporary and without prejudice to the agreement of June 11, 1896. The defendant then set up the contention that the plaintiffs were bound to continue the work at Torcross after July 31, 1897, at the original rate—namely, 2s. 6d. per cubic yard, and that the agreement of February 25, 1897, was a new one, and cancelled the one originally entered into on June 11, 1896. The defence set up by the defendant was a denial that the works at Torcross were of a temporary character. In consequence of the Exmouth shingle not being satisfactory for the requirements of the work, the parties, it was said, agreed to rescind the terms of the original contract and substitute for it an agreement to work at Torcross. After the repudiation of the contract, the defendant raised his own shingle by his own people, and the plaintiffs had therefore, it was contended, lost the benefit of the contract they entered into.

In the result, after a consultation had taken place between Counsel in his lordship's room, it was arranged that the defendant should withdraw his defence so far as it related that there had been a substitution for the agreement of June 11, 1896. All the other issues were referred to Mr. Pollock the official referee, to report to his lordship upon the figures. The question of costs to be dealt with after the reference. The jury were then discharged and the matter ended.

ARCHITECT *v.* BUILDER.

IN the Westminster County Court, on Friday last week, his Honour Judge Lumley Smith (Q.C.) and a jury tried the case of Green *v.* Vidal, in which the plaintiff, Mr. Percy Green, an architect, sued the defendant to recover payment for professional services rendered in drawing plans and specifications, and getting out bills of quantities in connexion with the erection of a building at the corner of Shaftesbury-avenue and Wardour-street.

The defence was that the plaintiff was only to be paid his fees in the event of his figures working out in such a way that the building could be erected for a sum of 500*l.* The plaintiff was called and absolutely denied the suggestion that he took up the work on the terms suggested by the defendant. As a matter of fact he did a very large amount of work in preparing plans and documents, and told the defendant all along that he ought not to have commenced the work unless he had 1,000*l.* to spend. When the whole of the work was almost completed a dispute arose, and the outcome of it was that he (plaintiff) had been unable to get payment of his account.

The defendant was called, and said the plaintiff took up the work on the distinct understanding that his charges were to be conditional in his planning a building which could be erected for a sum of 500*l.* He failed in doing that and hence the dispute arose.

The jury, after a lengthy hearing, found a verdict for the plaintiff for the full amount claimed (43*l.*), and judgment was entered with costs.

LIABILITY FOR DAMAGE BY STORM.

IN the Westminster County Court on Tuesday, his Honour Judge Lumley Smith, Q.C., tried the case of Shepherd *v.* Newman, in which the plaintiff, a wine merchant, carrying on business at 33, Saville-road, W., sued the defendant to recover the sum of 26*l.* odd in respect of damage done to his stock by reason of rainwater coming through the roof and finding its way into the cellar.

It appeared from the opening statement of counsel that both the parties were tenants of the same premises; the plaintiff being in occupation of the cellars, whilst the defendant carried on his business in the upper floors. In July of last year a very severe storm took place, and, as a result of the defective condition of the defendant's roof, the water overflowed and made its way down into the cellar.

The plaintiff was called, and said he attributed the flooding to the fact that the 3-in. water pipe on the defendant's roof was not sufficiently large to carry away the water of a heavy rain storm.

For the defence it was contended that the gutter-pipe was amply large for the purpose for which it was intended, and that the overflow of water was only the outcome of an exceptionally violent storm.

After hearing several witnesses on either side, his Honour said he did not think that any negligence had been proved, and therefore judgment would be for the defendant with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

24,629-30.—ARTIFICIAL ASPHALTS: *D. W. Peck.*—An asphalt, for paving and for other purposes, is made by heating and stirring a compound of coal tar, or coal-tar pitch, rosin, petroleum residuum, or a heavy oil, and sulphur.

24,657.—VICES: *A. Wachtl.*—In the vice's fixed part are formed two openings through which passes a guide-rail for the movable jaw, the two jaws are pressed away from one another by a tubular helical spring which also serves to protect the spindle of the screw from filings, &c.

24,761.—A CALCULATING MACHINE: *F. J. Bayldon and A. H. Armstrong.*—Whilst the invention relates more especially to the solution of the trigonometrical problems involved in determining a ship's course and her bearings, it is described as being also capable of application to certain other calculations wherein triangles and quadrilaterals are to be solved, as, for example, the determination of strains and stresses by means of graphic statics. The figure of a protractor, with base, perpendicular, and two radial pointers, is marked out upon the base board of the apparatus, in whose upper portion is a crossbar (set parallel-wise to the base) which slides within two dove-tailed guides, and carries a second, but smaller, protractor, upon which a double-ended pointer is adjusted. To the pointer is linked a rule that will always be parallel to it. All linear scales are graduated alike upon the rules, protractors, pointers, and so on. The pointers and bars can be locked in position by set-screws. There are two clock-dial faces with adjustable hands, and a separate scale with movable pointers for the registering of any data that may be needed.

24,788-9.—WATER-WASTE FITTINGS, PIPE-JOINTS, &C.: *R. W. McDonald.*—In order that it may be bolted on to the flange of the outlet pipe the overflow chamber of a lavatory basin is fashioned with a corresponding flange, whilst the collar into which the plug fits has a loose grating covered with an ornamental ring made of earthenware. For water-closet basins circular and respectively opposing grooves are fashioned upon the flanges of the trap and the basin, so that a key may be made by filling the grooves with cement.

24,800.—SASH FASTENINGS: *H. Davies.*—Upon the outer and upper sash-bar is a plate on to which is pivotted a lever, which is held in position by means of a spring catch, the catch being freed by the closing of the sashes so that a spring turns the lever round for engagement with a spring or gravity-hook fixed upon the inner sash-bar.

24,809.—PLUGGING THE TAP-HOLES OF BLAST AND CUPOLA FURNACES: *J. W. Miller.*—A nozzle is joined to a tube which is joined to a side tube fitted with a hopper, and also to a steam, hydraulic, or other cylinder whose ram or piston presses clay from the hopper along the side tube and into the other tube; the tube is also attached to a cylinder whose ram forces clay from it into the tap-holes.

24,819.—METHOD OF STOPPING LEAKS IN PIPES: *F. Dye.*—For stopping pipes which are screwed into a socket or fitting is devised a split collar whose halves have lugs whereby they may be fastened upon the pipe that leaks; packing is placed between the fitting and the collar, whereof the latter has a tapered screw thread for engagement with the exposed portion of the thread upon the pipe's end.

24,861.—CIRCULAR-SAW GUARD: *W. A. Webster.*—Two parallel links join a hood which has a counter-balancing weight and covers the saw to the main supporting bar, which is retained in an adjustable position in a bracket that is clamped on to the end of an arm at the top of a fixed pillar; on the hood's front is set a friction wheel. The bracket may be bolted on to a beam sustained by the roof.

24,908.—FASTENINGS FOR THE WOODEN BLOCKS OF GAS AND SIMILAR BRACKETS: *J. Lewis.*—A spike or holdfast is formed with either a squared end or arms upon its end (the arms may be triangular in cross-section); when the spike has been forced into the wall until the end, or its arms, become flush with the plaster, the wooden block of the bracket is fastened on to the spike's end, or arms, with screws.

24,928.—MOULDING BRICKS: *G. Austen.*—The moulds, drawn by chains and screw shackles in order that they may be spaced accurately, are carried by four radial arms supported on a ring upon chairs over the fixed table, a pug mill feeds clay to the moulds which are moved intermittently above the table by the engagement of a pawl with a lantern wheel on a shaft that drives the vertical shaft, the radial arms being borne with bevel gearing, the pressing and ejecting plungers are moved by a crank and a spur-wheel, and a crank and a toothed wheel, respectively; that part of the table which is beneath the ejecting plunger is mounted upon springs which the brick's weight depresses, and which will open again when the brick has been taken off; provision is made for sanding the moulds, and for preventing the escape of sand at their tops.

24,932.—COMPOSITION FOR DISTEMPERING OR PAINTING: *A. Nevin and T. Bulfield.*—The composition is formed of an admixture of benzoline, whiting, and similar materials, to which are added gold size and colouring matter, together with gold size and benzoline for thinning, and, it may be, boiled linseed oil; it is intended for use in distempering and painting walls and other surfaces, for the prevention of damp walls, and for the making of a suitable surface before the application of paint.

24,939.—DISCHARGE-FITTINGS FOR CLOSETS: *C. H. Martini.*—A swivelling siphon is fitted on to the discharge pipe, the soil is trapped when the siphon is raised, but when the siphon assumes a horizontal position the discharge is started and continues after the siphon has again been lifted; in one shape of the invention the siphon is operated by the filling of a chamber in order that it shall tilt the siphon.

24,957.—FETTLING, CUTTING OFF, AND FINISHING SANITARY PIPES, &C.: *J. R. W. Woodward and N. Collier.*—A moulded pipe is partly dried upon a heated floor, and then trimmed upon a mandrel or core, of which a loose strip is forced outwards against the pipe by means of springs, for the removal of blisters from the interior; on a weighted lever is a knife, which cuts off the pipe's end, and a roller makes grooves or scratches in the spigot end; for burning purposes the pipes are laid upon clay rings that are subsequently removed with a pivotted cutting-off frame, which is adjustable lengthwise, and also bears a set of knives for cutting any pipe into short lengths.

25,000.—TREATMENT OF SEWAGE: *C. G. Gell.*—Sulphates obtained by treating sewage sludge with sulphuric acid are employed for the treatment of sewage or waste water; after separation of the sulphates the sludge will serve as a manure or for fuel.

25,046.—HEATING APPARATUS FOR FLOORS, KILNS, &C.: *J. T. Cope.*—The apparatus comprises a set of ducts or tubes which are joined together when of metal with bolts, and with flush joints when larger in size and of iron or earthenware: the tubes, if triangular in section, may serve as casings for small pipes to convey high-pressure hot water or steam, the ends of the lines of tubes have caps which are joined together with loop-pipes or are connected with the flow or return pipes of the heating medium.

25,058.—ELECTRICAL CUT-OUTS: *H. G. Solomon.*—The fuse is so constructed that when the first fusible strip blows a second fusible strip is automatically at once put into the circuit; by one variation of the device a bar is connected to one of the terminals, whilst the main fuse connects it to another bar, which is pivotted upon a spindle connected to the other terminal, the first-named bar being connected, by means of a second fuse, to a contact fitted with a stop, a contact-lever, pivotted upon the spindle, is rigidly joined to an arm that is normally fixed to the bar, circuit is completed through the second fuse when the main fuse blows and a spring pulls round the arm together with the levers.

25,093.—SWING-GATES AND POSTS: *J. H. Hannay.*—A ball which fits into a socket serves as a hinge for the swing-gate at the bottom, whilst at the top

the gate has a hinge which consists of a pin that engages in the hole of an arm upon a vertical rocking-shaft which is actuated by a similar lever by means of a chain and pulleys or sprocket wheels; for opening the gate the rocking shaft is moved, on reversal of the shaft's movement for closing the gate, the gate is raised above the catch which otherwise holds it in an opened position.

MEETINGS.

FRIDAY, MARCH 30.

Institution of Civil Engineers.—Students' visit to the cement works of Messrs. John Bazley White & Brothers, Limited, at Swanscombe. 1.45 p.m.

SATURDAY, MARCH 31.

Royal Institution.—The Right Hon. Lord Rayleigh on "Polarised Light." V. 3 p.m.

London and Provincial Builders' Foremen's Association (Memorial Hall, Farringdon-street).—Monthly meeting, at which Mr. Sydney Butler will open a discussion on "Labour-Saving Machinery as applied to Builders' Work." 7.30 p.m.

MONDAY, APRIL 2.

Royal Institute of British Architects. — Messrs. John Honeyman, R.S.A., H. Spalding, W. E. Wallis, and Owen Fleming, on "Artisans' Dwellings." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—"The Hygiene of Byres, Lairs, Cow-sheds, and Slaughter-houses, and all Places where Animals destined for the Supply of Food are kept, and the Hygiene of Markets, Dairies, and other Places where Food is Stored, Prepared, or Exposed for Sale, and Transported." 8 p.m.

Society of Engineers.—Dr. G. Sims Woodhead, M.A., and Mr. W. J. Ware, on "Disinfection of the Maidstone Water Service Mains." 7.30 p.m.

Liverpool Architectural Society.—Mr. E. P. Hinde on "School Buildings." 6 p.m.

TUESDAY, APRIL 3.

Society of Arts (Applied Art Section). — Mr. Carl Hentschel on "Process Engraving." 8 p.m.

Institution of Civil Engineers.—Papers to be read and discussed: 1. "Economical Railway Construction in New South Wales," by Mr. Henry Deane; 2. "The Tocopilla Railway," by Mr. Robert Stirling. 8 p.m.

WEDNESDAY, APRIL 4.

Royal Archæological Institute of Great Britain and Ireland.—(1) "The Cyclic Poems and the Homeric Question," by Sir Henry H. Howorth. (2) "The Gift of the Papal Cap and Sword to Henry VII.," by Mr. J. Wickham Legg, M.D., F.S.A. 4 p.m.

British Archæological Association.—Dr. Winstone on "Two Commemorative Medals." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Association.—Mr. W. H. Hole, A.R.S.A., on "Inside Decoration of Public and Ecclesiastical Buildings." 8 p.m.

THURSDAY, APRIL 5.

Civil and Mechanical Engineers' Society.—Professor A. Sharp, B.Sc., on Fly-wheel Accidents." 8 p.m.

FRIDAY, APRIL 6.

Architectural Association.—Mr. Basil Champneys on "Hints on the Study of Planning of Collegiate Buildings." 7.30 p.m.

Royal Institution.—Professor Dewar on "Solid Hydrogen." 9 p.m.

Institution of Junior Engineers.—Mr. Eustace W. Porter on "A Comparison of Railway Bridge Structures of Moderate Dimensions and of Methods of Determining their Working Loads. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. E. Wimperis on "Experiments on Struts With and Without Lateral Loading." 8 p.m.

SATURDAY, APRIL 7.

Royal Institution.—Lord Rayleigh on "Polarised Light." VI. 3 p.m.

Edinburgh Architectural Association. — Visit to Balhaird.

British Institute of Certified Carpenters.—(1) Visit to St. Saviour's, Southwark. 3 p.m. (2) Monthly meeting, Mr. W. F. Sweett on "Air-tight Case Making." 6 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 14.—By WILLIAM WESTON (at Paddington).

Paddington.—5, Grittleton-rd., u.t. 63 yrs., g.r. 10*l.*, r., 55*l.*	£550
Bayswater.—47, Burlington-rd., u.t. 59 yrs., g.r. 10*l.* 10s., e.r. 60*l.*	400
Westbourne-pk.—63, 67, 69, and 71, Tavistock-cres., u.t. 63¾ yrs., g.r. 36*l.*, r. 180*l.*	1,680

By Messrs. SAUL (at Boston).

Langrick, Lincs.—"The Grange" and 30 a. 2 r. 28 p., f.	2,950
"Manor Farm," 115 a. 2 r. 9 p., f.	4,125
"Langrick Cottage" and 9 a. 2 r. 11 p., f.	1,050
Various Closes and a Cottage, 72 a. 2 r. 26 p., f.	3,410

By Messrs. KEMSLEY (at Enfield).

Enfield.—Cecil-av., 4 building plots, f.	1,890

March 15.—By PHILIP DAVIES (at Knighton).

Bleddfa, Radnor.—"The Storling Farm," 99 a., f.	2,800
Llanfihangel Rhydithon, Radnor.—"Cwm Villa," f.	225

By TOOTELL & SONS (at Maidstone).

Maidstone, Kent.—St. Luke's-av., three plots of land, f.	120

March 19.—By HENRY HOOPER.

Canning Town.—38 to 46 (even), Denmark-st., u.t. 68 yrs., g.r. 14*l.* 5s.	610

By ROBINS & HING.

Paddington.—Ashmore-rd., &c., i.g.r. 138*l.*, u.t. 63 yrs., g.r. 4*l.*	2,750
Hampstead.—Merton-rd., i.g.r. 80*l.*, u.t. 52½ yrs., g.r. 20*l.*	1,200
Kentish Town.—4 and 6, Allcroft-rd., u.t. 62 yrs., g.r. 13*l.*, r. 72*l.*	£660

By NOKES AND NOKES.

Tottenham.—354 to 366 (even), High-rd., u.t. 78 yrs., g.r. 47*l.* 10s., r. 287*l.*	1,620
115, 117, and 119, Welbourne-rd., u.t. 78 yrs., g.r. 13*l.* 10s.	555
108 to 116 (even), Somerset-rd., u.t. 78 yrs., g.r. 20*l.*	665
Caledonian-rd.—23, Twyford-st., u.t. 41 yrs., g.r. 6*l.*, r. 40*l.*	325

By FRED. VARLEY.

Finsbury Pk.—131, Blackstock-rd., u.t. 67 yrs., g.r. 6*l.* 6s., r. 45*l.*	420

By WAGSTAFF & SONS.

Bishopsgate.—Middlesex-st., f.g.r. 200*l.*, reversion in 99 yrs.	6,000

March 20.—By DAVID BURNETT & CO.

Soho.—39, Wardour-st. (building site), area 738 ft., f.	3,000
Regent's Pk.—Gloucester-gate, St. Katharine's House, u.t. 22½ yrs., g.r. 55*l.*, r. 155*l.*	1,150
Islington.—Essex-rd., &c., f.g.r. 39*l.*, reversion in 26 yrs.	1,450
Clapham.—46 and 48, Grandison-rd., u.t. 84 yrs., g.r. 13*l.*, r. 68*l.*	810

By E. H. Henry.

Battersea.—36, Warriner-gardens, u.t. 80¾ yrs., g.r. 7*l.* 5s., r. 40*l.*	405
Brixton.—2, The Ave., u.t. 74 yrs., g.r. 9*l.* e.r. 60*l.*	700
Wandsworth.—18, Bolingbroke-ter., f., r. 39*l.*	360
Balham.—2, Zennor-rd., u.t. 81 yrs., g.r. 13*l.*, r. 50*l.*	450

By R. PRICE & SON.

Walthamstow.—40 and 42, Granville-rd., f.	360
Battersea.—26, Parma-cres., u.t. 80 yrs., g.r. 6*l.* 10s., e.r. 38*l.*	340
Brixton.—Mauleverer-rd., f.g.r. 24*l.*, reversion in 98 yrs.	600

By WILLIS & CROUCH.

Stratford.—14 to 36 (even), Hubbard-st., u.t. 70 yrs., g.r. 42*l.*	1,750

By PROTHEROE & MORRIS (at Halstead).

Halstead, Essex.—Sudbury-rd., Linden House, u.t. 44½ yrs., g.r. 2*l.* 10s., r. 40*l.*	600

March 21.—By GEORGE BILLINGS.

Hackney.—39 and 41, Mehetabel-rd., u.t. 52 yrs., g.r. 4*l.*	515
Dalston.—1, 3, 5, and 7, Myrtle-st., u.t. 37½ yrs., g.r. 5*l.*, r. 100*l.*	915

By S. B. CLARK & SON.

Belgravia.—11, Motcomb-st., u.t. 23½ yrs., g.r. nil, r. 110*l.*	1,770
1, Kinnerton-st., u.t. 23½ yrs., g.r. nil, r. 30*l.*	385

By FARADAY & RODGERS.

Peckham....156 and 158, High-st., a profit rental of 30*l.* for 9 yrs.	120
Dalston.—37, Wilton-rd., u.t. 53¼ yrs., g.r. 6*l.*, r. 50*l.*	610

By THOMAS WOODS (at Hounslow).

Lampton, Middlesex.—Main-rd., Freehold Building land, 5 a.	2,050
Heston-rd, 8 plots of building land, f.	380

By BEALE & CAPPS (at Notting Hill).

Bayswater.—1 and 2, Richmond-mews, u.t. 52 yrs., g.r. 12*l.*	350
North Kensington.—8, The Triangle, u.t. 81 yrs., g.r. 9*l.*, r. 48*l.*	550

March 22.—By FAREBROTHER, ELLIS & CO.

Tooting.—Balham High-rd., f.g.r. 20*l.* reversion in 57½ yrs.	750
Palham High-rd., f.g.r. 16*l.*, reversion in 52 yrs.	640
St. Nicholas-rd., f.g.r. 57*l.* 6s. 6d., reversion in 63½, 64¾, and 66 yrs.	1,650
Trinity-rd., f.g.r. 8*l.*, reversion in 30 yrs.	285
Fulham.—468 and 468a, Fulham-rd., u.t. 61¼ yrs., g.r. 52*l.*, r. 100*l.*	600

By C. C. & T. MOORE.

Upton Park.—35 to 49 (odd), Waghorn-rd., f.	2,850
Waghorn-rd., f.g.r. 40*l.*, reversion in 98 yrs.	1,040
Dalston.—15, Navarino-rd., u.t. 53 yrs., g.r. 6*l.* 17s. 6d., e.r. 55*l.*	500
Canning Town.—252, Victoria Dock-rd., f., r. 30*l.*	410
Leytonstone.—95, Park Grove-rd., u.t. 79½ yrs., g.r. 4*l.* 10s.	140
Leyton.—Lincoln-st., f.g.r. 20*l.* 5s., reversion in 61 and 62 yrs.	360
Poplar.—354 and 356, Manchester-rd., u.t. 48¾ yrs., g.r. 16*l.* 10s.	250
Forest Gate.—13, Dames-rd., u.t. 68½ yrs., g.r. 7*l.* 10s.	150
Stratford.—22 to 34 (even), Livingstone-rd., u.t. 67¼ yrs., g.r. 22*l.* 1s.	500

By MOSS & JAMESON.

Camden Town.—183, King's-rd., u.t. 42 yrs., g.r. 8*l.*, e.r. 80*l.*	600
Dulwich.—179, Friern-rd., f., r. 52*l.*	635

By NEWBON, EDWARDS & SHEPHARD.

New Southgate.—5 and 7, Lauder-ter., f.r. 53*l.* 6s. Lauder-ter., f.g.r. 5*l.*, reversion in 67½ yrs.	625
Pentonville.—1, Holford-pl., u.t. 32 yrs., g.r. 6*l.*, r. 48*l.*	110
Maida Vale.—Warrington-cres., i.g.r. 26*l.*, u.t. 59 yrs., g.r. 5*l.*	450
Hoxton.—35, Essex-st., u.t. 69 yrs., g.r. 5*l.* 5s., r. 36*l.*	440
Caledonian-rd.—93, Blundell-st., u.t. 51 yrs., g.r. 5*l.* 10s., r. 30*l.*	430
Stoke Newington.—78, Alkham-rd., u.t. 76 yrs., g.r. 6*l.*, e.r. 38*l.*	335
Crouch Hill.—8 and 9, Highcroft-rd., u.t. 97 yrs., g.r. 20*l.*	425

By STIMSON & SONS.

Camberwell.—304, 306, and 308, Albany-rd., u.t. 18 yrs., g.r. 7*l.* 10s., r. 119*l.* 2s.	1,205
312 and 314, Albany-rd., also l.g.r. 5*l.*, u.t. 18 yrs., g.r. 7*l.* 10s.	600
316 to 332 (even), Albany-rd., u.t. 18 yrs., g.r. 22*l.* 10s.	335
334 and 336, Albany-rd., and 22 to 28 (even), Boundary-lane, u.t. 18 yrs., g.r. 12*l.*	1,415
5 to 9, Albany-st.' and Two Plots of Land in rear; also l.g.r. 31*l.* 5s., u.t. 18 yrs., g.r. 16*l.* 10s.	745
Notting-hill.—Sirdar-rd., f.g.r. 10*l.*, reversion in 67 yrs.	1,070
Bangor-St., f.g.r., 5*l.*, reversion in 67 yrs.	250
Herne Hill.—34, Shakespeare-rd., u.t. 69½ yrs., g.r. 6*l.*, r. 28*l.*	120
Penge.—13, 14, and 15, Green-lane, u.t. 77 yrs., g.r. 15*l.*	310
East Ham.—76, 78, and 80, Cleves-rd., f.	470
Victoria Docks.—15, 17, 19 and 21, Randolph-rd., f., r. 104*l.*	£510
Shoreditch.—13 to 17, New Norfolk-st., u.t. 75 yrs., g.r. 45*l.*	825
	870

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum: yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£ s. d.	£ s. d.
White Sea: first yellow deals	17 10 0	23 0 0
Second do.	16 0 0	17 10 0
Third do.	13 0 0	14 10 0
Battens, 40s., 30s., and 15s. less respectively.		
Petersburg: first yellow deals	15 0 0	17 10 0
Second do.	12 10 0	13 10 0
Battens, 30s. and 20s. less respectively.		
Petersburg, white deals	12 0 0	14 10 0
Do. white battens	9 10 0	11 0 0
Riga, white deals	10 0 0	11 0 0
Swedish mixed yellow deals	16 0 0	21 0 0
Third do.	14 0 0	17 0 0
Fourth do.	12 10 0	13 10 0
Fifth do.	11 10 0	12 10 0
Battens, 30s., 20s., and 10s. less respectively.		
Whitewood, 10 to 20 per cent. less.		
Finnish unsorted yellow deals	11 0 0	11 10 0
Battens, 10s. and 5s. less respectively.		
Whitewood, 5 to 10 per cent. less.		
Norwegian second yellow battens	8 0 0	8 10 0
Third do.	7 15 0	8 0 0
Fourth do.	7 10 0	7 15 0
Whitewood, 10s. less.		
Danzig, Crown Deck deals, per 40 ft. 3 in.	0 15 0	1 5 0
Brack	0 12 0	1 0 0
St. Lawrence Pine deals, &c., per P.S.H.:—		
1st, Bright and Dry, regular sizes	21 0 0	28 0 0
" " oddments	14 0 0	22 0 0
2nd " regular sizes	16 0 0	18 10 0
" " oddments	11 0 0	15 0 0
3rd " regular sizes	10 0 0	11 0 0
" " oddments	8 10 0	9 10 0
4th " regular sizes	9 0 0	10 0 0
" " oddments	8 0 0	9 0 0
St. Lawrence Spruce deals, &c.		
First, regular sizes	10 10 0	13 0 0
Second "	9 15 0	10 5 0
Third "	9 10 0	9 15 0
Fourth "	9 0 0	9 10 0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.		
New Brunswick Spruce deals, &c.	9 10 0	10 10 0
Oddments, battens, and fourths	9 0 0	9 10 0
United States pitch pine planks and boards	11 0 0	15 10 0
Prepared Boards, per square		
1¼ by 6½ and 7 in. 1st yellow	11 0	16 0
" " 2nd "	10 6	13 0
1 by 6½ and 7 in. 1st "	10 0	12 0
" " " white	9 0	10 0
" " 2nd yellow	9 0	11 0
" " " white	8 0	9 0
¾ by 6½ & 7 in. 1st & 2nd yellow	7 9	9 6
" " " white	7 6	8 6
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)	8 6	9 6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	7 6	8 6
¾ by 6½ and 7 in. 1st yellow and white (ditto)	6 6	7 6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	6 0	7 0
Narrower widths at 10 per cent. less. 3rd quality at 15 per cent. less than 2nd.		
Danzig and Memel Fir Timber— per load		
Best middling	3 15 0	4 0 0
Good middling and Second	3 5 0	3 10 0
Common middling	3 0 0	3 5 0
Undersized	3 0 0	3 5 0
Swedish and Norwegian Balks	2 10 0	2 15 0
Baltic Oak Timber—		
Danzig and Stettin—Large	3 15 0	4 15 0
Small	3 0 0	3 15 0
Quebec Timber per load		
Yellow Pine	5 0 0	6 10 0
Oak	4 15 0	6 15 0
Elm	4 5 0	4 10 0
Ash	3 10 0	4 5 0
Birch	3 7 6	5 15 0
New Brunswick, &c., Birch	3 5 0	4 0 0
American Pitch Pine Timber	3 17 6	4 10 0
Wainscot, per log, 18 cubic ft.—		
Crown (Eng. & Dutch) } nominal	3 10 0	4 18 6
Brack }	2 15 0	3 15 0
Lathwood, per cubic fathom—		
Petersburg	4 0 0	6 10 0
Riga and Danzig	4 10 0	5 10 0
Norway Poles, per ft. run	0 0 1	0 0 1½
Oak Staves, per mille full size pipe		
Memel, Crown	220 0 0	230 0 0
Brack	190 0 0	200 0 0
Danzig	165 0 0	175 0 0
Bosnia, single Barrel (nominal)	28 0 0	30 0 0
United States, Pipe	37 10 0	45 0 0
Hogshead, extra heavy and double extra	30 0 0	35 0 0
Indian Teake per load	11 10 0	16 10 0
British Guiana Greenheart	0 0 0	8 0 0

* The prices named are for the wood as imported and landed in the docks. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

[*See also page 331.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Borough Asylum	Cardiff Corporation	Not stated.	April 17
Schools, Bury, Lancs.	Grammar Schools Governors	100*l.* ; 60*l.* ; 30*l.*	June 1
Police Buildings, Offices, &c.	Kirkcaldy Town Council	50*l.* ; 30*l.* ; 20*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Artisans' Dwellings, New Beckton	East Ham U.D.C.	Engineer & Surveyor, Public Offices, East Ham	April 2
Road Materials, Broken Granite, Forage, &c.	Tottenham U.D.C.	The Clerk, 712, High-road, Tottenham	April 3
Kerbing, Tarpaving, &c.	Lewisham Board of Works	Surveyor's Department, Lewisham Town Hall, Catford	do.
Flints	Romsey (Hants.) Corporation	Borough Surveyor, Market Place	do.
Roads and Sewers, Westcliff, Southend		H. C. Kirby, Surveyor, Queen's Hotel, Westcliff, Southend	do.
Making-up West Promenade	Colwyn Bay U.D.C.	W. Jones, Civil Engineer, Council Offices	do.
Two Tall Chimneys at Gas Works	Dundee Gas Commissioners	Sir Thos. Thornton, City Chambers, Dundee	do.
Stables, Coach House, &c., Steartfield, Paignton	Mr. W. M. G. Singer	Bridgman & Bridgman, Architects, Bank Chambers, Paignton	do.
Two Subways, Llanelly Dock	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Pipes, Valves, &c.	Maidstone Corporation	Stevens & Barker, Engineers, St. Peter-street, Maidstone	do.
Harbour Extension	Nairn (N.B.) Harbour Trustees	D. & C. Stevenson, Engineers, 84, George-street, Edinburgh	do.
Road Works, Barrells Down-road	Bishops Stortford U.D.C.	R. S. Scott, Civil Engineer, Council Offices	do.
Additions, &c., to Steading, near Cruden, N.B.		J. Mowat, Architect, 340, Holburn-street, Aberdeen	do.
Setts, Kerbs, Flags, &c.	Middleton Corporation	W. Welburn, Boro. Surv., Town Hall, Middleton, nr. Manchester	do.
Broken Slag, Worksop		F. Hopkinson, Surveyor, 40, Bridge-street, Worksop	do.
Artisans' Dwellings, Chapel-lane, &c.	Bristol Corporation	City Engineer, 63, Queen-square, Bristol	do.
Alterations to Town Hall, St. Mary's-place	Barnsley Corporation	J. H. Taylor, Civil Engineer, Town Hall	do.
Flagging, Kerbing, &c.	Thornhill (Yorks.) District Council	S. W. Parker, Surveyor, Thornhill	do.
Slag, Whinstone, &c.	Whickham (Durham) U.D.C.	T. Lambert, Town Hall, Gateshead	do.
Street Works, Hilton Fold-lane, &c.	Middleton (Lancs.) Corporation	W. Welburn, Borough Surveyor, Town Hall	April 4
Elvan Road Metal (1,000 tons), Penryn, Cornwall	East Kerrier R.D.C.	J. H. Chubb, Surveyor, Belmont, Penryn	do.
Kerbs, Setts, &c.	Heaton Norris U.D.C.	J. G. Banks, Council Offices, Heaton Moor	do.
Sewers, Loscoe, near Normanton	Featherstone (Yorks.) U.D.C.	F. B. Rothera, Surveyor, Council Offices	do.
Paving Works, Smallbridge	Rochdale Corporation	S. S. Platt, Civil Engineer, Town Hall	do.
House, near Tregony, Cornwall	Mr. T. H. Beard	W. Swift, Architect, 38, Lemon-street, Truro	do.
Kitchen, Boiler House, &c., Greenmount, Cork		S. F. Hynes, Architect, 21, South Mall, Cork	do.
Club, Baxenden, Lancs.		Heywood & Harrison, Archts., Post Office Chambers, Accrington	do.
House, Smawthorne-lane, Castleford		Garside & Pennington, Architects, Castleford	do.
Concrete Wall, &c.	Lowestoft Town Council	G. H. Hamby, Civil Engineer, Town Hall	do.
Sewers, Charlotte-square, &c.	Edinburgh Corporation	Burgh Engineer, Corporation Offices	April 5
Chapel, Trimdon, Durham		J. Parkin, Trimdon Colliery, Durham	do.
Storerooms, Shed, &c., Headlands Estate, Pontefract		A. Oddy, Borough Surveyor, Town Hall, Pontefract	do.
School, Boothroyd-lane	Dewsbury School Board	F. W. Ridgway, Architect, Bond-street, Dewsbury	do.
Sewer Extension, Ellesmere-road, &c.	Shrewsbury Corporation	W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury	do.
Street Works, Millicent-road, &c.	West Bridgford (Notts.) U.D.C.	W. Pare, Civil Engineer, George-road, West Bridgford	do.
Additions to School & House, Moorends, nr. Doncaster	Thorne School Board	H. B. Thorp, Architect, Goole	do.
Cemetery Chapel, &c., near Peterborough	Farcet Parish Council	W. Bover, 10, Cowgate, Peterborough	do.
Making-up Elmer Approach	Southend Corporation	A. Fidler, Civil Engineer, Southend	do.
Alterations to Business Premises, Wakefield-road	Bradford Prov. Indus. Soc. Ltd.	Rycroft & Firth, Architects, Manchester-road, Bradford	do.
Steam Laundry Buildings	St. Albans Guardians	H. E. Hansell, Architect, Granville-road, St. Albans	do.
Bacteria Beds, Stonebridge	Durham R.D.C.	G. Gregson, Surveyor, Western Hill, Durham	April 6
Brick and Pipe Sewers, Keighley-road, &c.	Bingley (Yorks.) U.D.C.	R. Armistead, Engineer, 8, Charles-street, Bradford	April 7
Sewage Outfall Works, Stonebroom	Chesterfield R.D.C.	H. Walker, Civil Engineer, Albion Chambers, King-st. Nottingham	do.
Restoration of Parish Church, Caerwent, nr. Chepstow	Rev. W. A. Downing	G. E. Halliday, Architect, Cardiff	do.
Slag Road Metal, Anston, near Sheffield	Kiveton Park R.D.C.	G. W. Clarkson, Surveyor, Anston, Sheffield	do.
Wrought-iron Roofs	Prescot (Lancs.) Gas Company	J. E. Hall, Engineer, Gas Offices, Prescot	do.
Business Premises, Nicolson-street, Edinburgh		R. Wilson, Architect, 3, Queen-street, Edinburgh	do.
Surveyor's Materials	Cheadle (Staffs.) U.D.C.	E. Sykes, Civil Engineer, Council Offices	April 8
Chapel, Hirwain-road, Aberdare		T. Roderick, Architect, Ashbrook House, Aberdare	April 9
Street Works	Moss Side (Lancs.) U.D.C.	H. B. Longley, Engineer, Council Offices	do.
Infirmary	Chipping Norton Guardians	A. C. Rawlinson, Chipping Norton	do.
School Buildings	Neath School Board	J. Cook Rees, Architect, Church-place, Neath	April 10
Road Works, Park-lane	Handsworth U.D.C.	J. Hardcastle, Surveyor, Council Offices	do.
*Artisans' Dwellings, Plaistow	West Ham Council	Borough Engineer, Town Hall, West Ham	do.
*Wrought-Iron Railing and Gates to Church, Dewsbury		See Advertisement	do.
*Wood Paving Works	Hammersmith Vestry	Surveyor, Town Hall, Hammersmith, W.	April 11
Boring and Driving Heading, Bedworth, nr. Coventry	Foleshill R.D.C.	Beesley, Son, & Nichols, Engineers, 11, Victoria-street, S.W.	do.
Offices, Eleanor-street	Great Grimsby School Board	H. C. Scaping, Architect, Court Chambers, Grimsby	do.
*Roads and Sewers, &c., Beckenham		W. Newton Dunn, Architect, 1 and 2, Bucklersbury, E.C.	do.
*Painting Exterior of Workhouse and Infirmary	St. Leonard, Shoreditch, Vestry	F. J. Smith, Architect, Parliament Mansions, Victoria-st., S.W.	do.
*Alterations at the Poplars, 105, Peckham Rye	St. Olaves' Union	Newman & Newman, Architects, 31, Tooley-street, S.E.	April 12
Alterations to Institute, Pudsey		H. Hodgson, Architect, Old Bank Chambers, Bradford	do.
Chapel at Asylum, Monaghan		Hague & M'Namara, Architects, 50, Dawson-street, Dublin	do.
*Carpenters' Works, Iron Plate Wares, Lamps, &c.	Admiralty	Director of Navy Contracts, Admiralty, S.W.	April 12 & 20
Stables and Covered Yard, Bradford-road	Dewsbury Pioneers' Indus. Soc Ltd.	Holtom & Fox, Architects, Corporation-street, Dewsbury	April 13
Granite or Syenite Setts	Wolverhampton Corporation	J. W. Bradley, Civil Engineer, Town Hall	April 14
Nine Cottages, Broad Eye	Stafford Corporation	W. Blackshaw, Borough Hall, Stafford	do.
*Cast-Iron Water Pipes and Fittings	Coleraine U.D.C.	Town Surveyor, Town Hall, Coleraine, Ireland	do.
*Theatre at Llandudno	Grand Theatre Company, Ltd.	G. A. Humphreys, Architect, Llandudno	April 17
Removal of Residue from Refuse Destructor	Shoreditch Vestry	Chief Engineer, Coronet-street Shoreditch, N.	do.
*Iron and Stoneware Pipe Sewers, &c.	Hertford U.S.A.	Urban Smith, Civil Engineer, 41, Parliament-street, S.W.	do.
*Wharfage, Shoots, &c., for Disposal of Road, &c., Refuse	St. Martin's-in-the-Fields Vestry	Surveyor, St. Martin's Town Hall, Charing Cross-road	do.
*New Sorting Office, Salford, Manchester	Commissioners of H.M. Works, &c.	H.M. Office of Works, New Bridge-street, Manchester	April 18
*Stable and Ambulance Shed, Winchmore Hill	Enfield U.D.C.	Surveyor, Court House, Enfield	do.
Laundry and Additions to Workhouse	Swaffham (Norfolk) Guardians	A. Clarke, Architect, 126, London-road, Lowestoft	April 19
*Sewerage Works and Supply of Pipes, West Firle	Chailey R.D.C.	Towell & Co., Lewes	do.
*Laundry Machinery at Workhouse	Romford Union	See Advertisement	April 23
Storage Tank, Sewers, &c.	Plymouth Corporation	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Additions to Factory, Swindon	Messrs. Reynolds & Co.	W. H. Read, Architect, Corn Exchange, Swindon	April 28
*Sewage Farm, Straining Tanks, &c.	Mountain Ash U.D.C.	See Advertisement	May 1
House, Beeston-road, Leeds	Mr. K. Banks	G. F. Bowman, Architect, 5, Greek-street, Leeds	No date
Three Cottages, Little Wakering, Essex		S. J. Adams, Architect, Weston Chambers, Southend	do.
Residence, Newport, Mon.	Mr. J. S. Gaskell	Swash & Bain, Architects, Midland Bank Chambers, Newport	do.
Two Villas, New Tupton, Derbyshire	Mr. J. G. Metcalf	E. Oxley, Architect, Clay Cross	do.
Hotel, Stables, &c., Sutton-on-Sea		H. Walker, Architect, Albion Chambers, King-st., Nottingham	do.
Hall, Corporation-street, Birmingham		B. S. Smith, 33, Waterloo-street, Birmingham	do.
Whinstone, Limestone, &c.	Hemsworth (Yorks.) R.D.C.	T. H. Richardson, Surveyor, Hemsworth, near Wakefield	do.
Additions to House, Glyn-Neath, South Wales		Thornley & Jones, 100, St. Mary-street, Cardiff	do.
Hospital, Arbroath, N.B.		H. Gavin, Architect, Arbroath	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Borough Surveyor and Sanitary Inspector	Ludlow Town Council	120*l.*, &c.	April 2
*Working Foreman of Mechanics	Superintendent Billingsgate Market	2*l.* 15*s.* per week	April 4
*Engineering Assistant	West Ham Council	160*l.* per annum	April 7
*General Engineering Assistant	do.	do.	do.
*Two Temporary Architectural Assistants	do.	do.	do.
*Quantity Surveying Assistants	do.	130*l.* per annum each	do.
*Clerk of Works	I. of Thanet Joint Hospital Board	160*l.* per annum each	April 10
Clerk of Works	Wandsworth Baths Commissioners	3*l.* 13*s.* 6*d.* per week	do.
*Surveyor's (Second) Assistant	Hanley Corporation	4*l.* 4*s.* per week	April 19
		80*l.* rising to 100*l.* per annum	

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x. & xxiii. *Public Appointments, pp.* xxi. & xxiii.

PRICES CURRENT *(Continued)*.

	£	s.	d.	s.	d.
Mahogany, per foot superficial—					
Honduras, cargo average	0	0	4½	0	0 5½
Nicaragua, do.	0	0	4½	0	0 5½
Tabasco, do.	0	0	4½	0	0 6
Mexican, do.	0	0	4	0	0 4½
Panama, do.	0	0	3½	0	0 4
African, do.	0	0	3½	0	0 5
Cuba, do.	0	0	6	0	0 8
St. Domingo, do.	0	0	5	0	0 7½
Do. Curls (good to prime)	0	0	9	0	1 3
Walnut, American (logs)	0	3	0	0	5 0
Do. do. (planks and boards)	0	2	0	0	7 6
Italian, per foot superficial	0	0	3	0	0 7½
Black Sea, per ton	6	0	0	12	0 0
Satin Walnut (logs) per foot cube	0	1	0	0	1 6
" (planks and boards)	0	1	9	0	3 0
Sequoia (Californian redwood), per foot cube	0	1	3	0	2 0
Whitewood, American (logs)	0	1	4	0	1 9
" " (planks and boards)	0	1	9	0	2 9
Quartered oak " "	0	2	3	0	4 0
Kauri pine (logs)	0	1	9	0	2 0
" " (planks)	0	2	3	0	2 9
Jarrah (planks)	0	2	0	0	2 3
Lancewood spars each, fresh and large	0	5	0	0	7 0
Lancewood spars, ordinary to fair	0	3	0	0	4 0
Degame spars	0	8	0	0	10 0

METALS.

IRON—Pig, in Scotland ton	3	13	4	0	0	0
Bar, Welsh, in London	9	0	0	9	15	0
Do. do. at works in Wales	8	10	0	9	0	0
Do. Staffordshire, in London	9	15	0	11	15	0
COPPER—British cake and ingot	81	10	0	82	10	0
Best selected	82	10	0	82	12	0
Sheets, strong	86	0	0	87	0	0
Chili bars	78	5	0	0	0	0
YELLOW METAL lb.	6½d.			7d.		
LEAD—Pig						
Spanish ton	16	15	0	0	0	0
English Com. Brands	17	0	0	0	0	0
Sheet, English, 6 lbs. per sq. ft. and upwards	18	12	6	0	0	0
Pipe	19	0	0	0	0	0
ZINC—English sheet ton	26	10	0	0	0	0
Vieille Montagne	28	10	0	0	0	0
Spelter	21	2	6	21	5	0
TIN—Straits	135	0	0	0	0	0
Australian	135	0	0	135	10	0
English Ingots	139	10	0	140	10	0
Banca	0	0	0	0	0	0
Billiton	0	0	0	0	0	0

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¼d.	per ft. delivered.
" " fourths	2d.	" "
21 oz. thirds	3d.	" "
" " fourths	2¾d.	" "
26 oz. thirds	4d.	" "
" " fourths	3½d.	" "
32 oz. thirds	5d.	" "
" " fourths	4½d.	" "
Fluted sheet, 15 oz.	2½d.	" "
" " 21 "	3½d.	" "

OILS, &c.

Raw Linseed Oil in pipes, per ton	26	10	0	0	0	0
" " in drums, per gal.	0	2	4	0	0	0
Boiled " in pipes, per ton	28	10	0	0	0	0
" " in drums, per gal.	0	2	6	0	0	0
TAR—Stockholm barrel	1	6	6	0	0	0
Archangel	1	0	0	0	0	0
Turpentine, in barrels, per cwt.	2	2	0	0	0	0
" in drums, per gal.	0	3	4	0	0	0
Genuine Ground English White Lead	25	10	0	0	0	0
Red Lead	22	0	0	0	0	0
Best Linseed Oil Putty, per cwt.	0	8	0	0	0	0

BRICKS, &c.

	s.	d.	
Hard Stocks	31	0	per thousand alongside, in river.
Rough Stocks and Grizzles	29	0	" " " "
Smooth Bright Facing Stocks	58	0	" " " "
Shippers	42	0	" " " "
Flettons	29	6	" " at railway depôt
Red Wire Cuts	34	0	" " " "
Best Fareham Red	71	6	" " " "
Best Blue Pressed Staffordshire	86	0	" " " "
Best Stourbridge Fire Bricks	84	0	" " " "
Best White Glazed Stretchers	260	0	" " " "
Headers	240	0	" " " "
Quoins and Bull-nose	340	0	" " " "
Double Headers	320	0	" " " "
Best Dipped Salt Glazed Stretchers and Headers	240	0	" " " "
Quoins and Bull-nose	280	0	" " " "
Double Headers	280	0	per thousand at railway depôt.
Seconds Quality White and Dipped Salt Glazed	40	0	per thousand less than best.
Thames and Pit Sand		7	0 per yard, delivered
Thames Ballast		6	6 " "
Best Portland Cement	34	0	per ton "
Best Ground Blue Lias Lime	23	0	" "

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 31s. 6d. per ton at rly. dpt.

STONE.

	s.	d.	
Anstaer in blocks	2	0	per ft. cube, deld. rly. depôt.
Bath "	1	7	" "
Beer "	1	6½	" "
Grinshill "	1	10	" "
Brown Portland in blocks	2	2	" "
Darley Dale "	2	1½	" "
Red Corsehill "	2	5	" "
Red Mansfield "	2	4½	" "
Hard York "	2	10	" "

PRICES CURRENT (*Continued*).

Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	7	per ft. super. at rly. depôt.
" 6 in. Rubbed Ditto	2	10½	" "
" 3 in. sawn both sides slabs (random sizes)	1	3	" "
" " 3 in. self-faced Ditto	0	9	" "

SLATES.

in. in.	£	s.	d.	
20×10 best blue Bangor	11	5	0	per 1000 of 1200 at ry. dep.
" best seconds "	10	15	0	" "
16× 8 best "	6	2	6	" "
20×10 best blue Portmadoc	10	18	0	" "
16× 8 " "	6	0	0	" "
20×10 best Eureka unfading green	11	2	6	" "
16× 8 " "	6	15	0	" "
20×10 Permanent green and Sedan green	10	0	0	" "
16× 8 " "	5	12	6	" "

TILES.

	s.	d.	
Best plain red roofing tiles	40	6	per 1,000 at rly. depôt.
Hip and valley tiles	3	6	per doz. " "
Best Broseley tiles	47	6	per 1,000 " "
Hip and valley tiles	4	0	per doz. " "

TO CORRESPONDENTS.

E. P., S. F. H., A. G. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot unaertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BOLTON.—For rebuilding "Rose and Crown" inn and shop adjoining, Market-street, Farnworth, for the Crown Brewing Company, Limited. Messrs. Openshaw & Gill, architect, Fleet-street, Bury. Quantities by Mr. W. E. Gill:—

Platt & Castle	£2,320	0	0
J. Entwistle	2,163	0	0
G. Hodgkiss	2,033	12	6
J. C. & F. Woods	1,990	17	0
D. Diggle	£1,970	0	0
J. Tinline	1,895	0	0
Coope Bros.	1,889	3	0

BURY (Lancs.).—For the erection of stabling, stores, &c., for Messrs. Davenport Bros. & Co., Limited. Messrs. Openshaw & Gill, architects, Fleet-street, Bury. Quantities by Mr. Wm. E. Gill:—

J. Comfort	£976	15	2
Hall Bros.	950	0	0
Rawson & Jackson	935	7	7
J. Byrom	927	0	0
J. Taylor	875	0	0
J. Tinline	£852	10	0
Smith Bros.	817	3	6
Saw Mill Co.	812	3	6
S. Clough, School Brow, Bury*	810	0	0

CARDIFF.—For proposed additions to St. Francis Sunday schools, Roath. Mr. H. H. Turner, architect, 75, Mysore-road, Lavender-hill, S.W. Quantities by the architect:—

A. J. Howell £793 8 1 | S. Shepton & Son £725
Knox & Wells £675

CWMBRAN (Mon.).—For the erection of drill hall, armoury, &c., for Messrs. Phillips & Sons, Limited. Messrs. Swalwell & Creighton, architects, Steam Packet Chambers, Newport, Mon. Quantities by architects:—

Leadbeter Bros.	£1,349	0	
J. Partridge	1,325	0	
W. Jones & Son	1,277	0	
Wm. Price	1,248	0	
Lawson & Co.	1,180	0	
F. C. Parfitt	1,150	0	
D. J. Davies	£1,141	15	
C. H. Reed	1,134	0	
W. L. Sier	1,036	0	
Jas. Davies, Newport*	999	10	
J. Mainwaring	938	0	

DEVONPORT.—For erecting St. Chad's Mission Chapel, Devonport. Mr. Geo. H. Fellowes Prynne, architect, 6, Queen Anne's-gate, Westminster, S.W. Quantities by Mr. R. Henry Hale, 33, Old Queen-street, Westminster:—

Lethbridge & Sons	£4,456	0	0
Jenkin & Sons	4,265	0	0
H. Skinner	£4,172	19	0
J. P. Berry	4,039	13	2
Yeo & Sons, Torquay†	3,749	8	8

EPSOM.—For the supply of Guernsey granite, broken, for the Urban District Council. Mr. E. R. Capon, surveyor, Bromley Hurst, Church-street, Epsom:—
Mowlem & Co., Grosvenor Wharf, Westminster, 13s. 10d. per ton (700 tons).

ERITH.—For the execution of private street works, Sandcliff-road, Church-road, Crusoe-road, Friday-road, Alford-road, and Fraser-road, for the Urban District Council. Mr. A. H. Jennings, Surveyor, Council Offices, High-street, Erith. Quantities by Surveyor:—

Wm. Wadey	£3,942	16	8
F. Free & Sons	3,820	0	0
Thomas Adams	3,608	10	1
W. H. Wheeler	3,351	0	0
Lawrence & Thacker	3,243	3	6
A. J. Catley	£3,240	0	0
A. Bentham & Co., Streatham Hill, S.W.*	3,067	0	0

(Surveyor's Estimate, £3,307 3s. 2d.)

FRYERNING (Essex).—For the construction of roads and paths, for the Parish Council. Mr. H. Glynn Warne, surveyor, Tindal-square, Chelmsford:—

R. A. Bounat	£293	Osborne & Green, Ingatestone*	£200
White & Co.	290		

HOLLINGBOURNE.—For supplying and erecting steam-engine, washing-machine, and hydro-extractor at the Hollingbourne Union Workhouse, Kent:—
The Manchester Laundry Engineering Co., Cherry Tree (near Blackburn)* £165.

HYTHE (Kent).—For the execution of sewerage works for the Corporation. Mr. A. S. Butterworth, C.E., Hythe. Quantities by engineer:—

Johnson & Co.	£4,640	0	
Wallis & Sons	2,492	0	
Tuff & Miskin	£2,453	3	
Haisell, Hythe*	1,989	14	

INVERURIE (N.B.).—For the erection of public slaughter-house, and road-making, for the Police Commissioners. Mr. Geo. Gray, architect, Inverurie:—

Masonry.—Paul & Ritchie, Inverurie	£631	10	0
Carpentry.—John Watt, Inverurie	359	0	0
Plumbing.—Laing & Son, Inverurie	179	0	0
Plastering and Cementing.—Scott & Son, Aberdeen	188	0	0
Slating.—Geo. Mitchell, Inverurie	161	11	0
Painting.—Sutherland & Son, Inverurie	9	15	6
Road-making.—Wm. Duncan, Inverurie	229	10	0
	£1,758	6	6

KEITH (N.B.).—For the erection of a group of three cottages for working men's families, for Mr. Richard Thomson. Mr. F. D. Robertson, architect:—

Mason.—William McPherson, Fife, Keith*
Carpenter.—John Cormack, Keith* £220
Slater.—Alex. Strachan, Keith*
Plasterer.—George McKay, Keith*

LEEDS.—For the erection of farm buildings, &c., Pool Hall, for Mr. John Yeadon. Mr. W. H. Beevers, architect, 26, Bond-street, Leeds:—

Masonry.—J. & W. Dickinson, Weeton, near Leeds*	£760 0
Joinery.—S. Kaye & Son, Pool*	236 18
Slating.—H. Thornton, Otley*	41 0
Plumbing.—J. Suttle & Son, Otley*	22 0
Plastering.—J. Townsend, Horsforth*	25 10
Painting.—W. C. Gott, Bramhope*	12 18
	£1,098 6

LEWES.—For the construction of reservoir, and the execution of sewage works at Chailey Union House. Mr. H. Curtis Card, F.S.I., 10, North-street, Lewes:—

H. Crase	£689	16	6
Allfrey & Sons	580	0	0
W. Wells, Slumpton*	£476	12	9
J. Langridge	475	0	7

LONDON.—For the erection of boiler-house, chimney-shaft, &c., at workhouse, Bromley-by-Bow, E., for the Stepney Union Guardians. Mr. R. Banks Martin, architect, 121, Plashet-grove, East Ham. Quantities by Mr. J. R. Hunt, Queen Victoria-street, E.C.:—

T. Welsh	£7,629	J. Yates	£7,000
A. E. Symes	7,495	Gibb & Co.*	7,000
G. Sharp	7,417	Thomas & Edge	6,997
Dolman & Co.	7,372	Wall & Co.	6,850
Gregar & Son	7,235		

LONDON.—For erecting three shops and dwelling-houses over Nos. 190A, 192, and 192A. Rye-lane, Peckham, S.E., for Messrs. N. Hall & Co. Mr. Arthur Garnar, architect, 66, Oakhurst-grove, East Dulwich, S.E.:—

E. Jones	£3,647	10	
Larke & Sons	3,280	0	
G. Parker	3,144	0	
A. P. Maeers	£2,860	0	
H. Line*	2,755	0	

LONDON.—For tar-paving a portion of Nelson recreation-ground, for the London County Council:—

	Bottoming.	Topping.	Dust.	Spar quartz.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Shakeshaft Jones	1 1 6	1 5 0	1 1 6	1 5 0
Constable & Co.	0 18 9	1 0 9	0 12 6	1 10 0
J. Smart	1 0 0	1 3 0	0 12 6	1 2 6
Buxton Firms Lime Company*	0 17 8	1 1 8	0 14 0	1 10 0

[Per ton.]

[*See also next page.*

LONDON.—For proposed new Church of St. Bartholomew, Battersea. Mr. Geo. H. Fellowes Prynne, architect, 6, Queen Anne's Gate, Westminster, S.W. Quantities by Mr. R. Henry Hale, 33, Old Queen-street, Westminster :—

Rider & Sons	£8,997 0	A. Porter	£8,160 7
Nightingale	8,895 0	J. & C. Bowyer	8,095 0
Holliday & Greenwood	8,598 0	Holloway Bros.	8,054 0
Lathey Bros.	8,525 0	Goddard & Sons	7,488 0
Dove Bros.	8,515 0	Lorden & Sons, Tooting*	7,264 0

LONDON.—For chimney shaft, electricity supply station, Haggerston, for the Vestry of Shoreditch. Messrs. Kincaid, Waller, & Manville, engineers. Quantities by Mr. John R. Hunt :—

		Allowance for existing building.	
Smart	£5,700	—	£5,700
Hill	5,552	—	5,552
Jenkins	6000	£500	5,500
Chessum & Sons	5,493	93	5,400
Storr, Sons, & Co., Limited	5,499	100	5,399
Richardson	5,196	5	5,191

MARGATE.—For the execution of sewerage works, Garlinge, for the Town Council. Mr. Albert Latham, Borough Engineer, Margate :—
Tuff & Miskin, Rochester* £3,507

NEWMILL (Keith, N.B.).—For the erection of a group of four cottages for working men's families, for Mr. Morrison McConnachie. Mr. F. D. Robertson, architect :—
Mason.—William Cruckshank, Keith* ....
Carpenter.—William Russell, Fife, Keith*.
Slater.—John Taylor, Fife, Keith* ..... } £435
Plasterer.—George McKay, Keith* .....
Plumber.—Robert Kerr, Rathie, Keith*..
Painter and Glazier.—M. McConnachie, Keith* .....

NEWPORT.—For alterations to Dock-road Brewery, Newport, for Messrs. Phillips & Sons, Limited, brewers. Messrs. Swalwell & Creighton, architects, Steam Packet Chambers, Newport, Mon. Quantities by architects :—

Lawson & Co.	£2,079	Jones & Son, Newport*	£1,847
C. H. Reed	2,020		

TAMWORTH.—For alterations and additions to "Castle Hotel," Tamworth, for Messrs. Worthington & Co., brewers, Burton-on-Trent. Mr. J. W. Godderidge, architect, Tamworth. Quantities by the architect :—

Musson & Son	£5,400	E. Williams, Tamworth*	£4,600
Watton & Sons	5,350		
Clarson & Son	4,875		

Architect's estimate, £4,544

WANGFORD (Suffolk).—For the supply of Scotch granite, chips, &c., for the Rural District Council :—

	Per Ton. Granite.	Granite Chips.
	s. d.	s. d.
A. & F. Manuelle, London	13 6	11 6

WAUNLLWYD (Mon.).—For the erection of seventy-seven cottages at Waunllwyd, Mon., for the Waunllwyd and Waunllwyd Victoria Building Clubs. Messrs. Swalwell & Creighton, architects, Steam Packet Chambers, Newport :—
David Lewis, Llanhilleth* £12,490

WELLINGBOROUGH.—For the erection of a refuse destructor, East-end Yard, Cannon-street, for the Urban District Council. Mr. Ed. Sharman, Architect, Wellingborough :—
Mason, Limited, Manchester £1,480

WREXHAM.—For the construction of public baths, Willow depot premises, for the Town Council. Mr. J. W. M. Smith, Borough Surveyor, Guildhall, Wrexham :—

Davies Bros., Wrexham	£1,514	Gwilt Cathran, Wrexham*	£1,285

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect :—

NORTHEY-STREET.—Painting interior :—

Johnson & Co.	£339 0	G. Barker	£288 0
J. T. Robey	333 12	G. Wales	287 7
A. W. Derby	319 0	J. Haydon*	236 10
Gibb & Co.	299 0		

ST. JOHN'S (Halley-street).—Painting interior :—

J. T. Robey	£325 0 0	G. Wales	£239 4 0
Johnson & Co.	276 10 0	G. Barker	235 0 0
A. W. Derby	275 0 0	Gibb & Co.	232 0 0
Elkington & Sons	252 18 11	J. Haydon*	211 7 0

VAUXHALL-STREET.—Painting exterior and cleaning interior :—

H. & G. Mallett	£392 10	Maxwell Bros., Ltd.	£265
B. E. Nightingale	345 0	G. Brittain	260
Holloway Bros.	321 0	Rice & Son*	241
E. Triggs	283 0		

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